Materials for a Flora of the Malayan Peninsula.—By George King, M.B., LL.D., F.R.S., C.I.E., Superintendent of the Royal Botanic Garden, Calcutta.

No. 8.

[Recd. 18th May, Read 3rd June.]
ORDER XXXI. CELASTRINEE.

Erect or climbing trees or shrubs. Branches sometimes spinescent. Leaves opposite or alternate, more or less coriaceous, simple, petioled, rarely subsessile, entire or serrate; stipules caducous or 0. Flowers hermaphrodite or polygamous, usually cymose. Calyx small, with 4 or 5 imbricate lobes, persistent. Petals 4-5, rarely 0, inserted below the disc or continuous with its margin, imbricate. Stamens 3-5, rarely 2, filaments subulate or flattened, anthers 2-celled. Disc usually conspicuous, pulvinate or flattened, lobed or entire, rarely 0. Ovary sessile, the disc free at the base or confluent with it, 3-5-celled; style short or 0; stigma triangular, rarely 3-partite. Ovules 2 or 4 in each cell, anatropous, erect, rarely 1 and pendulous; or many, ascending and attached to the axis. Fruit capsular, baccate, drupaceous or samaroid. Seed arillate or exarillate, sometimes winged, albumen fleshy or 0; embryo usually large; cotyledons foliaceous, flat.—Distrib. Species about 500, scattered over the tropical and temperate regions of the whole world.

Tribe I. CELASTRINEÆ, Stamens 4 or 5; the filaments slender, often recurved, inserted on or beneath the margin of the disc. Seeds (except in Kokoona) albuminous.

Fruit dehiscent, leaves opposite (sometimes alternate in *Lophopetalum*).

Ovules 2 in the axis of each cell, petals
efoveolate.

Petals connate, seeds not arillate ...
Petals free, seeds arillate ...

Ovules 1 in each cell, pendulous; petals bifoveolate, seeds arillate ...

Ovules 4 or more in each cell; seeds winged.

Petals inappendiculate; disc cupular, the stamens inserted on its edge or on the inner vertical surface of its upturned edge; ovary not buried in the disc

Petals lamellate or crested on the upper surface; disc broadly orbicular, flat, the stamens inserted half way between the

- 1. MICROTROPIS.
- 2. Euonymus.
- 3. GLYPTOPETALUM.

4. Kokoona.

centre and circumference; ovary buried in the disc	5.	Lophopetalum.
Fruit dehiscent; leaves alternate; ovules 2 in		
each cell, erect; seeds arillate.		
Disc free from the ovary, the stamens insert-		
ed on its margin, capsule 3-celled	6.	CELASTRUS.
Disc confluent with the ovary, stamens insert-		
ed underneath it, capsule 3-celled	7.	GYMNOSPORIA.
Ovary free from the disc, and crowned by a		
tuft of hairs; styles 2, capsule entire or 2-		

lobed 8. Kurrimia.
Fruit a dry or pulpy indehiscent drupe ... 9. Elaeodendron.

Tribe II. HIPPOCRATEÆ. Stamens 3, rarely 2, 4 or 5; the filaments broad, flattened, recurved so that the authors dehisce outwardly, inserted on the disc; seeds exalbuminous; leaves usually opposite.

Fruit flattened, dehiscent, seeds winged ... 10. HIPPOCRATEA. Fruit globular or ovoid, pulpy and indehiscent, seeds not winged ... 11. Salacia.

1. MICROTROPIS, Wall.

Glabrous trees or shrubs. Leaves opposite, petioled or subsessile, exstipulate, entire. Flowers in sessile clusters or in peduncled cymes, axillary or supra-axillary, sometimes unisexual. Sepals 4 or 5, imbricate. Petals 4 or 5, rarely 0, connate at the base, erect. Stamens 5, inserted on the disc or on the tube of the corolla. Disc 0, or small. Ovary free, ovoid, perfectly or imperfectly 2-3-celled; style very short or absent; stigma minutely 2-4-lobed; ovules 2 in each cell, collateral at the inner angle. Capsule ovoid, coriaceous, 1-celled, 2-valved, 1-seeded, surrounded at the base by the persistent calyx. Seed erect, stipitate; aril 0.—Distrib. Species about 12; mountains of India, Ceylon, the Malayan Peninsula and Java.

Cymes sessile, very condensed, about as long as the petioles, axillary, under '5 in. long ... 1. M. elliptica.

Cymes and their peduncles '5 to '75 in. long ... 2. M. discolor.

Cymes extra-axillary, on long thin peduncles.

Cymes 3- to 5-flowered, their peduncles '5 to '75 in. long; petals ovate-rotund 3. M. bivalvis.

Cymes many-flowered, their peduncles 1.25 to 3 in. long; petals oblong ... 4. M. filiformis.

1. MICROTROPIS ELLIPTICA, n. sp. King. A shrub or small tree; young branches terete, pale when dry. Leaves thinly coriaceous, broadly

elliptic, rather suddenly and sharply acuminate, the base more or less cuneate; lower surface pale brown when dry, the upper olivaceous; main nerves about 6 pairs, curved, ascending, faint; length 4.5 to 5 in., breadth 1.85 to 2.5 in., petiole 3 in. Cymes axillary, condensed, sessile, not much longer than the petioles, 6- to 8-flowered. Flowers 25 in. in diam., sessile. Sepals 4 or 5, narrowly reniform, with dark coarse teeth. Petals 4 or 5, larger than the sepals, sub-rotund, fleshy, with sub-entire membranous edges. Stamens 4 or 5, slightly shorter than the ovary, much shorter than the petals; anther-cells divaricate at the base; the filaments flattened, broad and united into a tube in their lower half. Ovary 2-celled, produced into the long cylindro-conic glabrous style; stigma capitate, faintly 2-lobed. Fruit glabrous, ovoid, tapering to apex and base, the style and calyx persistent, length 6 to 7 in., its peduncle 2 in.

Malacca: Maingay (Kew Distrib.), No. 945/2. Penang: Curtis Nos. 345, 968. Perak: King's Collector, Nos. 1333, 1582, 4193.

2. MICROTROPIS DISCOLOR, Wall. Cat. 4337. An erect shrub or small tree; young branches thin, terete, smooth, dark-coloured when dry. Leaves thinly coriaceous, oblong-lanceolate, much acuminate, entire, the base acute; both surfaces dull when dry, the lower pale: main nerves 4 or 5 pairs, curved, ascending, faint; length 3.5 to 4.5 in., breadth 1 to 1.75 in., petiole .25 to .3 in. Cymes .5 to .75 in. long or less, slightly extra-axillary, spreading, divaricate, 8- to 10-flowered, bracteolate. Flowers 1 in. in length, subsessile. Sepals narrowly reniform, unequal, the edges minutely ciliolate. Petals much larger than the sepals, broadly oblong-ovate, rather concave, with a slight central ridge, glabrous. Anthers 5, ovoid, with short filaments inserted on a thin hypogynous disc. Ovary longer than the stamens, 2-celled, tapering into the thick conical style: stigma truncate, 2-lobed. Fruit subglobular, glabrous, 3 in. long. Kurz For. Flora Burma, I, 251; Lawson in Hook. fil. Fl. Br. Ind. I, 614; Arn. in Ann. Nat. Hist. iii. 152. Cassine discolor, Wall. in Roxb. Fl. Ind., ed. Carey, ii, 378. Celastrinea? Wall. Cat. 9014. Euonymus garcinifolius, Roxb. Fl. Ind. i. 628.

Penang, in damp ravines on West Hill, elevat. 2,000 feet, Curtis No. 1727; also on Government Hill.—Distrib. Sub-tropical Himalaya, Khasia Hills, Burma.

A species very common along the base of the Himalaya and the Khasia Hills and in Burma; but found in these provinces only in Penang. Mr. Curtis's specimens differ from those from British India in having rather smaller flowers and fruit, and much shorter filaments; otherwise they agree perfectly.

3. MICROTROPIS BIVALVIS, Wall. Cat. 4340. A bush or small tree; J. II, 44

young branches terete, dark-coloured when dry. Leaves thinly coriaceous, oblong-lanceolate, acuminate, entire, the base narrowed; both surfaces pale and rather dull when dry: main nerves 5 or 6 pairs, faint, not more prominent than the intermediates: length 2.5 to 3.5 in., breadth 1 to 1.75 in., petiole .25 to .35 in. Cymes extra-axillary, from 1 to 1.5 in. long; the peduncle filiform, 5 to 75 in. long. Flowers about 3 to 5, 25 in. in diam. on thin divaricating pedicels 2 to 3 in. long (longer in fruit). Sepals narrowly reniform, imbricate in two rows, sub-glabrous, pale, the edges dark-coloured and minutely crenulate. Petals larger than the sepals, spreading, rather coriaceous, ovate-rotund, narrowed to the base, glabrous. Stamens 5; the anthers broadly ovate, the filaments dilated and conjoined in their lower half into a tube. Disc none. Ovary short, 2-celled; style about as long as the stamens, cylindric, striate, expanded at the apex, the stigma truncate and 2-lobed. Fruit ovoid, glabrous, crowned by the persistent style and with the calyx persistent at the base, 5 in. long, usually 1-celled and 1-seeded, but sometimes 2-celled and 2-seeded. Lawson in Hook. fil. Fl. Br. Ind. I. 614 (in part).

Penang: Wallich's Collector; Curtis, No. 1025. Malacca: Maingay (Kew Distrib.) No. 392/2.

The plant here described is that issued by Wallich doubtfully as a Microtropis under the name M? bivalvis. It is not, as Wallich apparently supposed, the plant published by Jack in 1820 (Malayan Miscellanies No. V) as Celastrus? bivalvis; for Jack describes his plant as apetalous. I have seen no authentic specimen of Jack's plant; but I have little doubt that it is, as Miquel believed, the same as the species to receive which that Botanist founded in 1859 the genus Paracelastrus (Mig. Flora Ind. Bat. I, pt. 2, p. 590). Wallich issued under his Catalogue number 7270, and the name Euonymus capilluceus, a Penang plant with solitary capillary extra-axillary pedicels; but his specimens have neither flowers nor fruit. It is possible that this may be the lost Celastrus? bivalvis of Jack. The issue of Wallich's Catalogue was not. begun until 1828, eight years later than the issue of the number of the Malayan Miscellanies where Jack's C. ? bivalvis was published. But, as Wallich correctly suggested the genns Microtropis for his No. 4340, that author's name must stand for this plant, and another must be found for the true apetalous Celastrus? bivalvis of Jack, should Miquel's genus Paracelastrus not be maintained.

4. MICROTROPIS FILIFORMIS, King. A small tree, 10 to 15 feet high; young branches slender, terete, dark-coloured when dry. Leaves thinly coriaceous, more or less broadly elliptic, shortly acuminate, the edges sub-undulate, slightly recurved when dry, the base caneate; the apper surface shining, the lower dull, pale; main nerves 5 to 8 pairs,

spreading, indistinct, not more prominent than the intermediate and secondary; length 4.5 to 7 in., breadth 1.5 to 2.75 in., petioles .3 to .4 in. Cymes axillary or extra-axillary, on filiform peduncles 1.25 to 3 in. long, divaricate, bracteolate, 1-many-flowered. Flowers '3 in. in diam., on pedicels 'I to '2 in. long. Sepals narrowly reniform, sparsely-puberulous. Petals much longer than the sepals, oblong, obtuse, with a central longitudinal ridge on the upper surface, puberulous, united into a short tube at the very base. Stamens 5, longer than the pistil but much shorter than the petals; anthers broadly ovoid, the filaments dilated especially at the base and attached to the corolla tube. Ovary short, disc none; style cylindric, ridged; stigma broad, flat. Frust ovoid, pointed, glabrous, smooth; 5 in. long, the calvx persistent at its base, the style subpersistent on the apex. M. bivalvis, Lawson in Hook. fil. Fl. Br. Ind. I. 614 (in part) not of Wall. Microtropis bivalvis, Kurz (not of Wall.) For. Flora Burma, I, 251. Euonymus? lueta. Wall. Cat. No. 4294. Euonymus filiformis, No. 4295.

Penang: Porter, Stolickza. Perak: Wray No. 435, King's Collector, No. 2025. DISTRIB. Tenasserim. Helfer, No. 1980 (Kew Distrib.)

This has been included by Mr. Lawson in Fl. Br. Ind. under M. bivalvis, Wall., but it is a perfectly distinct plant; differing from that in the great length of the peduncles of its cymes, in the larger size of its leaves, and in its fewer larger flowers.

2. Euonymus, Linn.

Trees or shrubs, erect, rarely scandent, glabrous. Leaves opposite, petioled, rarely subsessile; stipules caducous. Calyx 4-5-fid, spreading or recurved. Petals 4-5, free, efoveolate. Stamens 4-5, inserted on the disc; authers broad, 2-celled. Disc large, fleshy, 4-5-lobed. Ovary sunk in the disc, 3-5-celled; style short or 0, stigma 3-5-lobed; ovules 2 in each cell, attached to the inner angle, ascending and suspended. Capsule 3-5-celled, 3-5-lobed, angled or winged, coriaceous, rarely echinate; cells 1-2-seeded, loculicidal. Seeds covered by the aril, albuminous.—DISTRIB. About 80 species chiefly tropical Asiatic and Malayan; a few European and North American.

Flowers usually in fascicles of 2 or 3, rarely in 2-

to 3-flowered cymes; petals fimbriate 1. E. Javanicus. Flowers in very lax divaricate slender spreading

10- to 20-flowered cymes; petals not fimbriate ... 2. E. Wrayi.

1. EUONYMUS JAVANICUS, Blume Bijdr. 1146. A shrub or small tree; young branches slender, sub-tercte. Leaves sub-coriaccous, ob-

long-lanceolate or elliptic-oblong, acuminate, remotely and obscurely serrate, or entire, the base cuneate; main nerves 5 or 6 pairs, impressed on the upper surface when dry; length 4 to 6 in., breadth 1.35 to 2.5 in., petioles .3 to .5 in. Flowers in fascicles of 2 or 3 from the axils of leaves or of fallen leaves, sometimes from a common peduncle 1 to 2 in. long: peduncles slender, .5 in. long, (much longer in fruit). Sepals 5, small, rotund. Petals 5, broadly oblong, much larger than the sepals, fimbriate. Stamens 5, the anther cells divaricate, the connective thick. Ovary conical. Fruit obovate or pyriform, deeply 5-lobed, .75 in. long. Benn. in Horsf. Pl. Jav. Rar. 13, t. 28; Hassk. in Nat. Tijdschr. Gesch. x. 149; Miq. Fl. Ind. Bat. I. pt. 2. p. 588; Hook. fil. Fl. Br. Ind. I. 607; Kurz For. Flora Burma, I. 249. E. sumatranus, Miq. Fl. Ind. Bat. Suppl. 512. E. sphaerocarpus, Hassk. Cat. Hort. Bogor. 229. E. timorensis, Zipp. ex Spanoghe in Linnea XV, (1841) 186.

In all the Provinces except the Andaman and Nicobar Islands. DISTRIB. Burma, the Malayan Archipelago.

A widely distributed species, varying very little. The form distinguished as *E. sumatranus* by Miquel has rather longer fruit than usual, and its leaves are more distinctly serrate.

2. Euonymus Wrayi, n. sp. King. A small tree; young branches terete, smooth, dark-coloured when dry. Leaves as in E. javanicus, but the main nerves less prominent. Cymes axillary or terminal, long-pedunculate, very lax, 3 to 4 in. across; the branches filiform, divaricate, 12- to 20-flowered, bracteolate at the base; the peduncles slender, 1.5 to 2 in. long. Flowers nearly .25 in. in diam. on slender minutely bracteolate pedicels .25 to .35 in. long. Sepals 5, large, rotund, spreading, concave, glabrescent, the edges membranous. Petals 5, not much larger than the sepals, rotund, clawed; the edges incurved, undulate but not fimbriate, minutely puberulous, green with dull crimson veins. Anthers 5, short, with globular cells opening upwards, the connective orbicular. Disc thick, fleshy, obtusely 5-lobed. Ovary sunk in the disc, broad with a conical apex: stigma capitate, small. Fruit shortly and broadly pyriform, deeply 5-lobed; calyx persistent at its much-contracted base, .75 in. long and nearly as broad at the apex.

Perak: on Gunong Batu Pateh, elevat. 4,500 feet; Wray No. 403. Pahang: Kota Glanggi, Ridley No. 2652.

3. GLYPTOPETALUM, Thwaites.

Erect shrubs or small trees, glabrous. Leaves opposite, petioled, ex-stipulate. Cymes 3- or more-flowered. Calyx with 4 short spreading lobes. Petals 4, each with 2 pit-like depressions on the upper surface. Stamens 4, inserted above the disc; the connective dilated; anther-cells

diverging. Disc 4-lobed. Ovary immersed in the disc, 4-lobed, 4-celled; style short, stigma capitate; ovules solitary and pendulous from the top of each cell. Capsule subglobose, coriaceous, 1-4-celled, 1-4-seeded. Seeds as in Euonymus.—Distrib. Species 7; in Ceylon, Southern India, and Malayan Peninsula.

Leaves 2.5 to 3.5 in. long 1. G. Scortechinii. ,, 6 to 12 in. long ... 2. G. quadrangulare.

1. GLYPTOPETALUM SCORTECHINII, n. sp. King. Young branches terete, striate. Leaves coriaceous, elliptic, often slightly obovate, very shortly and obtusely cuspidate, the edges with a few remote obscure serratures in the upper third, the base cuneate; main nerves 8 to 10 pairs, spreading, much curved, very faint and not more prominent than the intermediate and secondary nerves; length 2·5 to 3·5 in., breadth 1·35 to 1·75 in., petioles ·25 in. Flowering peduncles rather stout, supraaxillary, 1·5 to nearly 2 in. long; pedicels 2 or 3, under an inch in length. Fruit broadly obovate, deeply 5-lobed, glabrous, ·45 in. long, the 5 sub-rotund reflexed sepals persistent at its base.

Perak: Scortechini, No. 1617.

A species collected only by the late Rev. Father Scortechini, whose specimens are not in flower. He referred the plant to *Euonymus*, but the solitary ovules in the cells of the immature fruit show that its place is in *Glyptopetalum*.

2. GLYPTOPETALUM QUADRANGULARE, Prain MSS. in. Herb. Calc. A. shrub 8 to 15 feet high; young branches boldly 4-angled, narrowly winged. Leaves coriaceous, elliptic or elliptic-oblong, shortly acuminate, obscurely and remotely serrate in the upper half, the base rounded or cuneate; both surfaces bullate, the upper shining, the lower dull; main nerves 10 to 12 pairs, when dry much depressed on the upper and very prominent on the lower surface, the reticulations wide and distinct: length 6 to 12 in., breadth 2.5 to 5 in., petiole 3 to 6 in. Cumes much shorter than the leaves, dichotomous, minutely 2-bracteolate at the bifurcations, axillary, few-flowered, on slender peduncles 1.5 to 2 in. long (nearly twice as long in fruit). Flowers 3 in. in diam., their pedicels 2.5 in. long (longer in fruit). Sepals 4, narrowly reniform, entire. Petals 4, attached to the edges of the thick fleshy 4-lobed disc, much longer than the sepals, broadly rotund-reniform, clawed, the edges incurved, smooth. Anthers reniform; the cells on short thin filaments, sub-orbicular. Ovary sunk in the disc, the capitate stigma alone projecting, 4-celled: ovules solitary. Fruit depressed, obtusely 4-angled, capsular, 4 to 6 in. in diam.

Perak: Scortechini No. 524. Wray No. 3229: King's Collector Nos. 7106, 8222.

4. Kokoona, Thwaites.

Trees with opposite petioled coriaceous leaves. Calyx small, 5-lobed. Petals 5, free, coriaceous, without crests. Stamens 5, inserted on the margin of the disc; anthers oblong. Disc thick, glandular, sub-entire. Ovary immersed in the disc, 3-celled; style short, stigma 3-lobed; ovules 4 in each cell, in 2-series, adnate to the axis, ascending. Capsule woody, oblong, 3-gonous, 3-celled, 3-valved; cells 4-seeded. Seeds broadly winged above, imbricate, exalbuminous.—Distrib. Species 5; Ceylon, Malayan Peninsula and Borneo.

The only tangible distinctions between this genus and Lophopetalum appear to be that (1) in this there are no appendages of any kind on the petals, whereas in Lophopetalum they are lamellate or crested (or both) on the anterior surface; (2) the disc in this is cupular and the stamens are inserted either on its edge or on the inner vertical surface of its up-turned edge; (3) the ovary is not buried in the disc, whereas in Lophopetalum the disc is broadly orbicular and flat and the stamens are inserted (often in pits) half way between its centre and circumference, the ovary being buried in the disc. The seeds, which used to be relied upon for distinctive marks, are found, now that the ripe fruit of Lophopetalum is better known, to be winged in both, and the fruit in both to be an elongated triquetrous or 3-winged capsule. It seems doubtful whether this genus should be maintained as distinct from Lophopetalum.

Panicles much longer than the leaves, 4 to 6 in. long; flowers 1 in. in diam. ... 1. K. littoralis. Panicles shorter or only a little longer than the leaves; flowers 25 or 3 in. in diam.

Leaves elliptic or elliptic-oblong, 2.75 to 3.5 in. long 2. K. Scortechinii. Leaves broadly ovate to ovate-oblong, 4.5

to 5 in. long 3. K. coriacea.

1. Kokoona Littoralis, Laws. in Hook. fil. Fl. Br. Ind. I, 617. A tree; leaves thinly coriaceous, broadly ovate, acute or sub-cuspidate, entire, subundulate, the base rounded; main nerves 8 to 10 pairs, spreading, faint; length 3 to 4 in., breadth 2 to 2.5 in., petiole 8 to 1 in. Panicles axillary or terminal, large, 4 to 6 in. long and about as much across, many-flowered, bracteolate, the branches divergent, the branchlets cymose. Flowers 1 in. in diam., the pedicels about as long. Calyx lobes sub-acute. Petals not crested or fimbriate; filaments inserted on the edge of the disc. Disc orbicular and without appendages. Fruit capsular, broadly 3-winged, 4.5 in. long and 1.5 in. broad, the pericarp coriaceous; Seeds 1.5 to 2 in. long, oblong, compressed, winged all round. Lophopetalum littoralis, Kurz For. Flora Burma, I, 255. Trigonocarpus littoralis, Wall. Cat. No. 6520.

Malacca: Maiugay. Singapore; Lobb.—Distrib. Burma.

2. Kokoona Scortechinii, King n. sp. A large tree 70 to 80 feet high; young branches smooth, dark-coloured when dry. Leaves coriaceous, elliptic or elliptic-oblong, acute or sub-acute, entire, the base cuneate, lower surface cinereous when dry; main nerves about 6 or 7 pairs, spreading, faint; length 2.75 to 3.15 in., breadth 1.35 to 2 in., petioles '25 to '35 in. Panicles axillary, peduncled, pyramidal, sometimes longer than the leaves; the branches divaricate, the ultimate branchlets racemose. Flowers not crowded, about 25 in., in diam., on bracteolate pedicels about as long as themselves. Calyx cupular, fleshy, glabrous, with 5 (rarely 4) shallow broad teeth. Petals 5, (rarely 4), inserted below the disc, longer than the calyx, fleshy, broadly ovate. with a slight vertical central ridge on the anterior surface. Disc fleshy, shortly cylindric, with 10 shallow quadrate teeth. Stamens 5; the filaments fleshy below, slender above, inserted on the inner surface of the disc. Anthers large, ovate, sub-cordate at the base, the apex with a short stout incurved appendage. Ovary conical, short, thick, free from the disc, 3-celled. Stigma sessile, large, capitate-cylindric. Fruit unknown.

Perak: Scortechini, No. 2042. Penang, Curtis, No. 1576.

This has been gathered in Penang by Mr. Curtis, who describes it as a tree about 40 feet high. The late Father Scortechini, who gathered it once in Perak, and who referred it doubtfully to Lophopetalum reflexum Laws., describes it as a tree 70 to 80 feet high. Its fruit is still unknown.

3. Kokoona coriacea, King n. sp. A tree 30 to 50 feet high; young branches cinereous when dry. Leaves coriaceous, broadly ovate to ovate-oblong, sub-acute, the base cureate, the edge when dry slightly recurved; upper surface dark when dry, the lower cinereous; main nerves 6 or 7 pairs, curved, erecto-patent, rather faint on both surfaces; length 4.5 to 5 in., breadth 2 to 3 in., petiole 5 to 6 in. Panicles axillary, pedunculate, from half as long to as long as the leaves. the branches divaricate, racemose, few-flowered. Flowers 3 in. in diam. on bracteolate pedicels shorter than themselves. Calyx cupular, thick, with 5 short shallow broad teeth. Petals 5, attached outside the short disc, longer than the calyx, thick, broadly ovate, with a vertical ridge in the middle. Stamens 5; the filaments subulate, inserted on the inner vertical surface of the cupular fleshy obscurely 5-lobed corrugated disc: anthers large, cordate, with a long apical appendage. Orary ovoid. glabrous, inserted in the fundus of the flower and separate from the disc. 3-celled: stigma sessile, cylindric-capitate. Fruit unknown.

Perak: King's Collector, No. 4226.

5. LOPHOPETALUM, Wight.

Trees or shrubs, usually glabrous. Leaves opposite or alternate, petioled, exstipulate. Sepals 5, rounded, short, spreading. Petals 5, continuous with the disc, persistent, the upper surface cristate or lamellate, or covered with fleshy villi, or naked. Stamens 5, inserted on the disc far from its edge; anthers oblong. Disc large, flat, entire or lobed. Ovary small, immersed in the disc and continuous with it, trigonal or pyramidal, 3-4-celled, contracted into a short style, stigma capitate; ovules 4 or more in each cell, in 2 series. Capsule coriaceous, 3-4-angled, 3-4-celled, loculicidal. Seeds winged, albumen fleshy.—Distrib. Species 15; Indian and Malayan.

Leaves very thickly coriaceous; flowers '75 in.		
in diam., cymes longer than the leaves	1.	L. pachyphyllum
Leaves thinly coriaceous.		
Flowers 5 in. in diam	2.	$L.\ fimbria tum.$
Flowers 25 to 3 in. in diam.		4
	3.	L. subobovatum.
Leaves not obovate.		
Disc without fleshy hair-like processes		
Sepals bluntly ovate		
	5.	L. oblongum.
Disc with numerous fleshy hair-like		
processes over its whole surface.		
Leaves 2.5 to 3 in. long; petals		
rotund-deltoid, the upper surface		7 3313
with numerous fleshy processes	6.	L. pallidum.
Leaves 4.5 to 6 in. long; petals		
ovate-elliptic, with a broad-based		
acuminate fleshy process on the	P7 (T 17 'C 7'
upper surface	7.	L. oblongifolium.
Disc with fleshy processes only at		
the edges of the pits in which the filaments are inserted	0	L. Curtisii.
riowers only about tim. in diam	υ.	L. reflexum.
Imperfectly known species		L. fuscescens.

1. Lophopetalum pachyphyllum, n. sp. King. A tree 80 to 100 feet high; young branches slender, terete, dark-coloured when dry. Leaves thickly coriaceous, elliptic-oblong, sub-acute, entire, the base narrowed; upper surface pale when dry; the lower cinereous, thickly

covered with very minute papillae; main nerves 7 or 8 pairs, ascending, curved; length 4 to 5.5 in., breadth 1.6 to 2.75 in., petiole 5 to 75 in. Cymes paniculate, axillary or terminal, bracteolate, 3 or 4 in. in diam., on peduncles 2 to 3 in. long. Flowers 75 in. in diam.; their pedicels slender, bracteolate, about 5 in. long. Calyx and disc rotund, scarcely lobed. Petals attached to the edge of the disc, rotund with truncate bases, thick, not fimbriate. Disc fleshy, slightly convex, the slender filaments rising far from its edge; anthers ovate. Ovary expanded below, 3-angled above, glabrous. Fruit unknown.

Malacca: Maingay (Kew Distrib.) No. 403. Perak: King's Collector No. 7325.

Fruit of this is unknown. The species is a very distinct one, at once recognisable by its large flowers and very thick leaves. The petals, according to Kunstler, are pale yellow with a dark patch at the base.

2. Lophopetalum fimbriatum, Wight III. I. 178. A small tree: young branches terete, dark-coloured when dry. Leaves thinly coriaceous, elliptic or elliptic-oblong, shortly cuspidate, entire, the base rounded or slightly narrowed; upper surface olivaceous when dry, the lower brown; main nerves 7 to 9 pairs, spreading, curving, slightly prominent beneath; length 3 to 4.5 in., breadth 2 to 2.25 in., petiole .65 in. Cymes axillary or terminal, peduncled, paniculate; the branches divaricate, many-flowered. Flowers .5 in. in diam., on pedicels .25 in. long. Calyx-lobes very short. Petals rotund-obovate, much larger than the sepals, with transverse fimbriate crests about the middle. Stamens with long slender filaments, inserted on the middle of the broad 5-lobed disc. Ovary depressed, tapering into the conical style. Fruit 3-angled (ripe unknown). Laws. in Hook. fil. Fl. Br. Ind. I. 615; Kurz For. Flor. Burma, I. 255. L. ovatum, Presl. Botan. Bemerk. 32. L. javanum. Turcz. in Bull. Soc. Nat. Mosc. 1863, pt. i. 545. Euonymus ovata, Wall. Cat. 4300.

Malacca: Griffith.—DISTRIB. Burma, Chittagong, Sylhet.

3. Lophopetalum sub-obovatum, n. sp., King. A tree; young branches cinereous when dry. Leaves obovate-oblong, obtuse, slightly cuspidate, entire, much narrowed to the base, the lower surface pale brown when dry; main nerves about 6 pairs, spreading, faint; length 2.5 to 4 in., breadth 1.4 to 2 in., petiole 35 to 45 in. Panicles axillary, pedunculate, 2 to 3.5 in. long, and 1 to 2.5 in. in diam., branching from near the base, the branches divaricating; the branchets cymose, fewflowered. Flowers 3 in. in diam. Calyx spreading; the teeth deltoid, sub-acute. Petals 5, larger than the calyx, broadly-oblong, sub-obtuse, corrugated on the upper two-thirds of the anterior surface and

crested. Disc thick, fleshy, entire, pitted. Stamens 5; the filaments subulate, their bases in small inappendiculate pits; anthers small, ovate. Ovary sunk in the disc, conical; stigma minute. Fruit unknown.

Penang: on Government Hill, Curtis, No. 1501.

4. Lophopetalum Scortechini, n. sp. King. A tree 60 to 80 feet high: young branches slender, terete, dark-coloured when dry. Leaves coriaceous, broadly elliptic or ovate, sometimes obovate; the apex obtuse sub-acute or very shortly cuspidate, the base narrowed; main nerves about 5 pairs, spreading or ascending, faint; length 3.5 to 4.5 in., breadth 1.75 to 2.25 in., petioles 4 to 5 in. Panicles cymose, axillary, shorter than the leaves, the flowers rather crowded towards the end of the short divaricating compressed branches. Flowers 25 in. in diam. Sepals 5, bluntly ovate, spreading. Petals 5, deltoid-rotund, spreading, flat with undulate edges, attached to the edges of the broad thin 5-angled fleshy disc. Anthers 5, sub-sessile, ovate-orbicular; ovary much depressed, sunk in the disc with only the capitate stigma protruding, 4- or 5-celled. Fruit (mature not seen) elongate, glabrous, 3-winged, 3-celled, the calyx persistent at its base; seeds flat, winged at both ends. Euonymus mammillaris, Scortechini MSS.

Perak: Scortechini, No. 1941; King's Collector, No. 6676.

5. Lophopetalum oblongum, n. sp. King. A tree 50 feet high: young branches striate, dark-coloured when dry. Leaves coriaceous, oblong or elliptic-oblong, acute, entire, the base cuneate; main nerves 7 or 8 pairs, curved, spreading; length 3.5 to 4.5 in., breadth 1.5 to 1.8 in., petiole 4 to 5 in. Panicles axillary, rather shorter than the leaves, 2.5 to 3.5 in. in diam., the branches divaricate; the branchets cymose, many-flowered. Flowers 3 in. in diam.; their pedicels 1 in length. Sepals 5, deltoid-rotund, thick, spreading. Petals 5, thinner and longer than the sepals, each with an elongate sub-fimbriate crest on the anterior surface. Stamens 5, inserted far from the edge of the thick fleshy slightly 5-angled disc: anthers ovate, filaments short. Ovary sunk in the disc, tapering into the rather thin style, stigma minute. Fruit woody, 3-winged, 5 in. long and nearly 1.5 in. broad. Seeds flat, 2.5 in. long (including the wings.)

Penang: near the waterfall, Curtis, No. 2736.

6. LOPHOPETALUM PALLIDUM, Laws. in Hook. fil. Fl. Br. Ind. I. 615. A glabrous tree; young shoots slender, dark-coloured when dry. Leaves thinly coriaceous, elliptic-oblong, sub-acute, entire, the base rounded, both surfaces pale when dry; main nerves 8 to 10 pairs, spreading, faint; length 2.5 to 3 in., breadth 1.1 to 1.3 in., petiole .3 to .4 in. Cymes .5 to .75 in. long, axillary, 6- to 8-flowered, the peduncle and branches 4-angled. Flowers .25 in. in diam.; calyx and disc rotund, not lobed. Petals rotund-deltoid, fleshy, attached to the edge of the

disc, incurved, with a number of fleshy lobular processes on their upper surface. *Disc* fleshy, almost flat, with many thick fleshy hair-like processes shorter than the filaments. *Anthers* 5, ovate; the filaments longer than the anthers, inserted in pits on the disc. *Ovary* broadly conical. *Fruit* unknown.

Malacca: (Kew Distrib.) No. 393.

Known only by Maingay's scanty specimens, not one of which is in fruit.

7. LOPHOPETALUM OBLONGIFOLIUM, King n. sp. A tree 80 to 100 feet high: young branches glabrous, terete, dark-coloured when dry. Leaves opposite, coriaceous, oblong or elliptic-oblong, shortly and rather bluntly acuminate, entire, the base cuneate, both surfaces glabrous; main nerves 8 or 9 pairs, spreading, slightly curved; length 4.5 to 6 in., breadth 1.75 to 2.25 in., petiole 5 to 65 in. Panicles axillary and terminal, about half as long as the leaves, minutely bracteolate, glabrous; the branches spreading, the ultimate branchlets cymose. Flowers 25 in. in diam., their pedicels about as long as themselves. Calyx flat, corrugated externally, the edge with 5 broad sub-reniform short teeth closely applied to the corolla. Petals 5, continuous with the margin of the disc, much larger than the calvx-lobes, ovate-elliptic, the edges slightly laciniate or entire, the upper surface with a broad-based pointed fleshy appendage and some hairs. Disc flat, broad, obscurely 5-angled, covered with very short coarse bristle-like hairs. Stamens 5, inserted on the disc, filaments short: anthers ovate, 2-celled, longitudinally dehiscent. Ovary conical, sunk in the disc, 3-celled; style short, thick; stigma small. Fruit unknown. Euonymus adenophorus, Scort. MSS. in Herb. Calc.

Perak: Scortechini, No. 1943.

8. LOPHOPETALUM CURTISH, n. sp. King. A medium-sized tree: young branches very slender, dark-coloured when dry. Leaves coriaceous, broadly ovate, cuspidate, entire, the base cuneate; upper surface when dry at first glaucous, afterwards dark-coloured, the lower always pale and very minutely dotted, both glabrous; main nerves about 6 pairs, curving, faint; length 2 to 2.5 in., breadth 1 to 1.5 in.; petiole 5 or 6 in., slender. Cymes axillary or terminal, about 1 to 1.35 in. long; the branches divaricating, 10- to 20-flowered. Flowers 3 in. in diam., as in L. pallidum but the hair-like processes on the disc confined to the edges of the pits in which the bases of the filaments are inserted.

Penang on Government Hill; Curtis No. 1577.

A species with flowers like L. pallidum, but with leaves of thicker texture, broader, and with longer petioles. The cymes also are larger and the disc is devoid of processes, except round the edges of the pits from which the filaments spring

9. Lophopetalum reflexum, Laws. in Hook. fil. Fl. Br. Ind. I. 616. A tree 40 to 50 feet high, young branches darkly cinereous when dry. Leaves coriaceous, ovate-lanceolate, acuminate, the edges undulate; the base slightly cuneate, rarely rounded; main nerves 4 or 5 pairs, very faint; length 2·25 to 3·25 in., breadth 1 to 1·2 in., petiole ·25 to ·3 in. Panicles longer than the leaves, pedunculate; the branches divaricate, cymose, many-flowered, bracteolate, sparsely and minutely rufous-pubescent. Flowers ·1 in. in diam., their pedicels twice as long or more. Sepals 5, thick, fleshy, rotund-deltoid, spreading. Petals 5, thinner and larger than the sepals, rotund-ovate, inserted on the edge of the orbicular entire fleshy disc. Anthers 5, almost sessile on the disc far from its edge, broadly ovate. Ovary broadly conical, sunk in the disc, 3-celled, tapering into the short style, stigma minute. Fruit unknown.

Malacca: Maingay (Kew Distrib.) No. 393/2. Penang: Curtis, No. 1502.

Imperfectly known species.

LOPHOPETALUM FUSCESCENS, Kurz in Journ. As. Soc. Beng. for 1875, pt. 2, p. 202. A glabrous tree. Leaves coriaceous, oblong, shortly acuminate, entire, rounded at the base, the lower surfaces of the leaves ferrugineous when dry: main nerves 16 to 18 pairs, prominent on the lower surface; length 4 to 8 in., breadth 2.5 to 3 in., petiole 8 to 1.25 in. Panicles axillary and terminal, shorter than the leaves, pedunculate; the branches spreading, cymose, puberulous, minutely bracteolate. Flowers probably about 2 in. in diam., their pedicels stout and longer than themselves. Calyx-lobes short, broad, rounded. Petals ovate, rather obtuse, coriaceous with broad membranous margins, induplicate in bud, glabrous, each with an elongated trigonous corrugated process on its upper surface. Disc indistinctly 5-lobed, rugulose when dry. Stamens 5, with rather long filaments. Fruit uuknown.

Singapore; T. Anderson.

The description of the flowers of this species is taken from Kurz (l. c.). The only specimens which I have seen are two collected by the late Dr. T. Anderson at Singapore and named by Kurz himself, and the flowers on these are too imperfect for examination. These specimens have quite the facies of a Lophopetalum allied to L. oblongifolium.

6. CELASTRUS, Linn.

Scandent shrubs. Leaves alternate, petioled; stipules minute and deciduous, or 0. Flowers polygamous or hermaphrodite, in terminal or axillary panicles or racemes. Calyx 5-cleft. Petals 5, spreading. Disc

broad, concave. Stamens 5, inserted on the margin of the disc. Ovary not immersed in the disc, 2-4-celled; style short; stigma 3-lobed, rarely 3-fid with the segments recurved; ovules 2 in each cell, erect. Capsule globose or obovoid, 1-3-celled, 1-6-seeded. Seeds enveloped in a fleshy aril, albumen fleshy; cotyledons foliaceous.—Distrib. Species about 20; natives of tropical Asia, China, Japan, Australia and North America.

Celastrus Championi, Benth. in Hook. Journ. Bot. for 1851, p. 334. A climber 40 to 50 feet long: branches slender, smooth, black when dry. Leaves coriaceous, elliptic, elliptic-oblong or ovate, acute or shortly acuminate, the base rounded or sub-cuneate, the edges minutely serrate or sub-entire, both surfaces glabrous; main nerves 5 or 6 pairs, slightly prominent on the lower surface; length 3.5 to 4.5 in., breadth 1.8 to 2.5 in., petiole 5 in. Racemes several from one axil, usually shorter than the leaves. Fruits on pedicels as long as themselves, dehiscing, 3-valved: the dehisced valves broadly ovoid, black externally, pale within, about 5 in. long, one-seeded. Benth. Flora Hongkongensis, 64. Catha Benthami, Gardn. and Champ. in Hook. Journ. Bot. for 1851, 310.

Perak: Wray Nos. 175, 1031, 1096: King's Collector No. 6928 and 6982; Scortechini No. 1428; Ridley No. 5237.

7. GYMNOSPORIA, W. & A.

Shrubs or small trees, branches often spinescent. Leaves alternate, exstipulate. Flowers in small dichotomous cymes. Calyx 4-5-cleft. Petals 4-5, spreading. Stamens 4-5, inserted underneath the disc. Disc broad, sinuate or lobed. Ovary attached by a broad base, or immersed in the disc, 2-3-celled; style short, 2-3-lobed; ovules 2 in each cell. Capsule obovoid or nearly globose. Seeds 1-2 in each cell; aril completely or partially covering the seed, or 0, albumen fleshy; cotyledons foliaceous.—Distrib. Species 60; natives of the hotter parts of the whole world.

Gymnosporia Curtisii, King n. sp. A scandent shrub; young branches rather stout, cinereous, glabrous. Leaves coriaceous, ovate-elliptic, sub-acute, the edges with distant shallow crenations, the base rather suddenly narrowed to the petiole; both surfaces glabrous, the lower slightly paler when dry; main nerves about 10 to 15 pairs, often forking below the middle, faint; length 4 to 6 in., breadth 2.25 to 3 in., petiole 4 to 5 in. Cymes about 5 to 7 in. long, few-flowered, fasciculate, often collected at the apex of extra-axillary naked branches 1.5 to 2 in. long. Flowers 15 in. in diam.; their pedicels two or three times as long, glabrous. Sepals 5, semi-orbicular, the edges with a few short thick cilia. Petals 5, oblong, obtuse, much longer than the sepals. Stamens 5, shorter than the petals, the filaments inserted below the

disc, flat, incurved; anthers small, sub-orbicular. Disc a wide fleshy cup with thick entire edge. Ovary ovoid, obscurely 3-angled, seated on and confluent with but not immersed in the disc, 3-celled. Style short, clavate. Fruit broadly ovoid, almost globular, 3-angled; the pericarp coriaceous, dark-coloured externally, 3-valved, the dehisced valves almost square. Seeds 1 or often 2 in each cell.

Kedah: Curtis No. 2500.

Known only by Curtis's specimens. Inasmuch as (1) the stamens are inserted below and not on the margin of the disc, (2) the ovary is inserted on and confluent at its base with the disc, and (3) the inflorescence is cymose and not racemose or paniculate, this is a Gymnosporia rather than a Celastrus. The scandent habit, however, is that of Celastrus. It appears to me a little doubtful whether these two genera ought to be kept distinct. The species of both are in want of careful revision.

8. Kurrimia, Wall.

Trees, usually glabrous, young branches tipped with the deciduous stipules. Leaves opposite, rarely alternate, towards the ends of the branches, coriaceous, entire, shining, penninerved, petiole slender. Flowers in panicles or racemes. Calyx 5-fid, spreading. Petals 5, inserted under the margin of the disc, spreading or recurved. Stamens 5, inserted with the petals. Disc fleshy, sub-entire or 5-lobed. Ovary free, glabrous or puberulous at the base, crowned at the top with a tuft of hairs; styles 2, filiform; stigmas small, capitate; ovules 2 in each cell, erect. Capsule entire or 2-lobed, 1-2-celled, dehiscing by 2 valves, 1-2-seeded. Seeds erect, completely or partially covered by a fleshy aril; albumen abundant, fleshy, cotyledons linear-oblong.—Distrib. India, Ceylon, Malayan Peninsula and Archipelago: species 3 or 4.

Flowers in racemes, glabrous, disc sub-entire, fruit not bifid 1. K. pulcherrima. Flowers in panicles, puberulous, disc deeply 5-lobed, fruit bifid 2. K. paniculata.

1. Kurrima pulcherrima, Wall. Cat. 4334. A tree 40 to 70 feet high; young branches glabrous. Leaves coriaceous, oblong or ellipticoblong, acuminate, entire, the base rounded; both surfaces glabrous, the upper shining, the lower dull and pale when dry; main nerves about 12 pairs, curved, ascending, prominent on the lower surface; length 6 to 8 in., breadth 1.75 to 3.25 in., petiole 8 to 1 in., narrow and spike-like. Racemes several from an axil, shorter than the leaves, glabrous. Flowers on pedicels shorter than themselves, '15 in. in diam.,

glabrous. Sepals 5, free, elliptic, obtuse. Petals 5, elliptic-rotund, obtuse, larger than the sepals. Stamens 5; anthers broadly ovate, cordate, filaments flattened. Disc cupular, glabrous or nearly so, the edges obscurely lobed. Capsule narrowly ellipsoid, with 2 vertical grooves, much tapered to the apex, glabrous, 1 to 1.5 in. long, 1-celled, 1-seeded. Seed 6 to 8 in. long, ellipsoid, brown, shining. Lawson in Hook. fil. Fl. Br. Ind. I. 622. K. Maingayi, Laws. l. c. K. robusta, Kurz For. Flora Burma, I. 253. K. calophylla, Wall. Cat. 4335. K. robusta, Kurz MSS. Rhesa Moja, Ham. MSS. ex Arn. in Ed. Phil. Journ. xvi. 315; Walp. Rep. i. 538. Celastrus robustus, Roxb. Fl. Ind. i. 626. Nothocnestis sumatrana, Miq. Fl. Ind. Bat. Suppl. i. 531.

Malacca: Griffith, No. 1994 (Kew Distrib.). Singapore; Maingay, Kew Distrib. No. 394. Andamans, King's Collectors. Distrib. Burma, Chittagong, Khasia Hills, Assam and Sikhim, Sumatra.

I cannot discover any mark to separate K. Maingayi, Laws. from typical K. pulcherrima, Wall, and I have therefore reduced that species here. This is a much rarer tree in the Malayan Peninsula than the next which is very common.

2. Kurrimia paniculata, Wall. Cat. 4336. A tree 30 to 60 feet high; young shoots glabrous. Leaves coriaceous; leaves as in the last but often slightly narrowed to the base, and sometimes with as many as 24 pairs of nerves; petioles varying from 1 to 2.25 in. and occasionally even 3 in. in length. Panicles shorter than the leaves, the branches sparse and spike-like, puberulous. Flowers 15 in. in diam., on pedicels about as long as themselves. Sepals 5, spreading, ovate, obtuse, puberulous. Petals 5, much larger than the sepals, broadly ovate, sub-acute, puberulous, especially on the inner surface. Stamens 5, rather shorter than the petals, inserted between the deep quadrate lobes of the disc; the filaments flattened, puberulous; the anthers short, broadly ovate. Ovary sub-rotund, pubescent towards the narrowed apex. Fruit 65 in. long, more or less deeply bifid, each half 1- or sometimes 2-seeded; the pericarp leathery, nearly black externally and glabrous. Seeds oblong, often plano-convex, with dark shiny testa, 3 in. long. Lawson in Hook. fil. Fl. Br. Ind. I. 622. Rhesa paniculata, Arn. in Ed. Phil. Journ. xvi. 315; Walp. Rep. i. 538. Trochisandra indica, Bedd. Fl. Sylv. t. 120; Fl. Sylv. Anal. Gen. lxvii. Pyrospermum calophyllum, Mig. Fl. Ind. Bat. Suppl. i. 402.

In all the provinces except the Nicobar and Andaman islands. A much commoner tree than the last. DISTRIB. Sumatra.

There is considerable variety in the length of the petiole in this species, but I cannot discover that differences in its length are associated with differences in any other organ.

9. ELÆODENDRON, Jacq. f.

Small trees or shrubs. Leaves opposite or subopposite, crenate or entire. Flowers in axillary branching cymes, often polygamous. Calyx 4- or 5-cleft. Petals 4 or 5, spreading. Disc cupular. Stamens 4 or 5; anthers nearly globose. Ovary continuous with the disc, conical, rarely 2-4- or 5-celled, style very short, ovules 2 in each cell. Fruit succulent or dry, 1-2-celled, indehiscent; cells 1- rarely 2-seeded. Seed without an aril, albuminous.—Distrib. About 40 species, natives of South Africa, Tropical Asia, America and Australia.

ELEODENDRON SUB-ROTUNDUM, King n. sp. A tree 20 feet high: young branches sub-compressed, glabrous, dark-coloured when dry. Leaves broadly ovate or sub-rotund, obtuse or sub-cuspidate, the edges entire and slightly revolute, the base slightly narrowed or rounded; both surfaces glabrous, dull, the upper pale, the lower brown when dry: main nerves 6 or 7 pairs, spreading obliquely, little curved: length 2 to 2.5 in., breadth 1.2 to 1.8 in.; petiole .3 to .5 in., slender. Cymes axillary and terminal, umbellate on a common peduncle, 1.5 to 2.5 in. long, 1.5 to 2 in. in diam., much-branched, many-flowered. Flowers numerous, nearly '2 in. in diam., their pedicels longer than themselves. Calyx short, capular, deeply divided into 4 or 5 rotund concave lobes. Petals 4 or 5, broadly oblong, blunt, spreading, glabrous, sparsely scaly outside. Disc short, cupular, thin, wavy, not lobed. Stamens 4 or 5, inserted on the outer surface of the disc; the filaments nearly as long as the pistil, slender; anthers ovate, basifixed. Ovary ovoid, tapering, surrounded at the base, but not confluent with, the thin disc, 2-celled; style short, stigma small. Fruit (immature) 5 in. long, oblong-clavate, darkcoloured, glabrous, crowned by the persistent style, 1-celled (by abortion) and 1-seeded.

Perak: King's Collector No. 1166. Andamans; Kings's Collector. Johore; King, Pahang; Ridley No. 1001 a.

This differs from *E. glaucum*, Pers, in having smaller flowers which are always 4-merous; in having a smooth (not lobed or corrugated) disc; a much less tapering ovary; and entire leaves with fewer nerves.

10. HIPPOCRATEA, Linn.

Small trees or scandent shrubs. Leaves opposite, petioled; stipules small, caducous. Flowers small, white or greenish, disposed in axillary cymes, more rarely in terminal cymose panicles. Calyx small, 5-parted or of 5 free sepals. Petals 5, spreading, much larger than the calyx, imbricate or valvate. Stamens 3, the filaments recurved and lying in the grooves of the ovary; anthers short, broad, often 1-celled and with transverse dehiscence. Disc flat or cupular. Ovary surrounded by the

disc, 3-celled; style very short or 0, stigmas 1-3; ovules 2-10 in each cell, in 2 series, inserted on the inner angle. Fruit of 3 flattened carpels connate at the base, usually dehiscent. Seeds compressed, usually winged below, exalbuminous.—Distrib. Species about 90, natives of the tropics of both hemispheres.

Panicles and flowers ferrugineous-tomentose.

Flowers '2 in. long 1. H. ferruginea.

Panicles and flowers glabrous, or at most
puberulous, never ferrugineous.

Flowers 3 in. or more in diam.

Petals glabrous on the upper surface ... 2. H. macrantha.

Petals densely glandular-villous on the

upper surface 3. H. Cumingii.

Flowers 15 in. in diam.

Leaves entire; petals broadly oblong-

obovate ... 4. H. Andamanica.

Leaves remotely and rather minutely ser-

rate; petals orbicular ... 5. H. Nicobarica.

Flowers 05 in. in diam. ... 6. H. indica.

Doubtful species H. Maingayi.

1. HIPPOCRATEA FERRUGINEA, King n. sp. A climber; young shoots slender, glabrous, the older cinereous. Leaves coriaceous, elliptic-oblong, sub-acute or shortly cuspidate, entire, the base rounded or sub-cuneate; both surfaces glabrous, shining, the reticulations rather distinct; main nerves about 5 pairs, curved, ascending; length 3.25 to 5.5 in., breadth 2 to 2.5 in., petiole 3 to 4 in. Panicles axillary, nearly as long as the leaves, with large divaricating ferrugineous-pubescent pyramidal branches. Flowers 2 in. long, on pedicels rather shorter than themselves. Sepals 5, rotund, concave, densely rusty-tomentose outside. glabrous inside. Petals 5, several times longer than the sepals, oblongobovate, with long slender claws, conduplicate, rusty-tomentose outside, glabrous inside, falcately curved so that the tips connive. Disc large, its lower edge thickened and wavy. Stamens 3, the filaments flattened, broad, reflexed; the anthers sub-globular, 1-celled, with transverse dehiscence. Ovary inserted on the disc, sub-globular, deeply 3-lobed. Style cylindric, stigma minute. Fruit unknown.

Penang: Curtis, No. 175.

Known only by Mr. Curtis's specimens.

2. HIPPOCRATEA MACRANTHA, Korth. Verh. Nat. Gesch. 187, t. 39. A climber; young branches slender, minutely lenticellate, glabrous. Leaves coriaceous, elliptic, sometimes rotund-elliptic, rarely slightly obovate, shortly and obtusely cuspidate, the edges with shallow cre-

nations, the base cuneate or rounded, both surfaces glabrous; main nerves 5 or 6 pairs, spreading, curving, prominent on the lower surface; length 4 to 7 in., breadth 1.75 to 3.25 in., petiole .2 to .4 in. Panicles axillary, cymose, pedunculate, much shorter than the leaves, puberulous, minutely bracteolate. Flowers '3 in. in diam., on thin pedicels longer than themselves. Calyx cupular, puberulous, with 5 broad shallow obtuse teeth. Petals 5, much longer than the calyx, lanceolate, puberulous on the lower, glabrous on the upper surface. Disc deep, fleshy, with a broad ring of minute hairs on its upper half, deeply scooped out on the upper surface to receive the small 3-celled ovary; the 3 stamens attached to the margin of the disc, their filaments flat and much recurved; anthers small, rounded. Carpels usually 2, flat, oblong, obtuse, sometimes obovate-oblong and emarginate at the apex, striate, 2.5 to 4 in. long. Seeds 2 to 3 in. long, the wing large and thinly membranous. Mig. Fl. Ind. Bat. I, pt. 2 p. 599: Kurz For. Flora Burma, I, 257. H. lanceolata, Ham. Wall. Cat. 4214. H. grandiflora, Wall. Cat. 4215. H. obtusifolia, Laws. (in part but not of Roxb.) in Hook. fil. Fl. Br. Ind. I, 624.

South Andaman: King's Collector. Perak: King's Collector. Wray: common. DISTRIB. Burma, Chittagong, Assam, Sikhim, Terai.

Flowers of Chittagong and Assam specimens of this which I have dissected agree perfectly with Korthal's figure. Most of the specimens from the other localities cited are in fruit only; but their leaves agree so absolutely with the flowering specimens from Assam as to leave no doubt that they are conspecific. Helfer's No. 905 (Kew Distrib.), and perhaps Griffith's No. 911 from the Eastern Himalaya, belong to this. H. Gumingii, Laws. resembles this both in flowers and leaves; but the petals in that are glandular-hairy on the upper surface, while in this the upper surface of the petals is quite glabrous.

3. HIPPOCRATEA CUMINGII, Laws. in Hook. fil. Fl. Br. Ind. I, 624. Scandent; young branches slender, brown when dry, glabrous. Leaves coriaceous, broadly elliptic, acute or shortly and obtusely cuspidate, the base rounded; both surfaces glabrous, the lower reticulate. Panicles axillary, shorter than the leaves, dichotomously cymose, few-flowered. Flowers 45 in. in diam., their pedicels longer than themselves. Calyx cupular, covered with minute deciduous tomentum, the mouth with 5 shallow broad rather blunt lobes. Petals much longer than the calyx, linear-oblong, sub-acute, densely glandular-villous on the upper surface, minutely tomentose on the lower. Disc broad, with a belt of hairs about the middle. Fruit unknown.

Malacca: Griffith. DISTRIB.—Philippines.

An imperfectly known species.

4. HIPPOCRATEA ANDAMANICA, n. sp. King. A climber; young branches slender, glabrous, pale-brown when dry. Leaves thinly coriaceous, oblong to elliptic, sub-acute or shortly and obtusely cuspidate, entire, the base cuneate; both surfaces glabrous; main nerves 5 to 7 pairs, ascending, curved, slightly prominent beneath; length 4 to 5.5 in., breadth 1.8 to 2.75 in., petiole .4 to .6 in. Panicles often several together, axillary or terminal, as long as or slightly longer than the leaves, many-flowered, much-branched. Flowers 15 in. in diam., on pedicels longer than themselves, buds globular. Calyx of 5 broad rotund spreading sepals, united at the base and irregularly dentate on the edges. Petals 5, larger than the sepals. broadly oblong-obovate, obtuse, glabrous, spreading. Disc broad, fleshy, hollowed out to accommodate the small 3-partite ovary. Stamens 3, inserted on the inverted edge of the disc; filaments short, broad, recurved; anthers broad, 1-celled by abortion, dehiscing transversely. Style short, stigma sub-capitate. Fruit unknown.

South Andaman Island; King's Collectors.

5. HIPPOCRATEA NICOBARICA, Kurz in Journ. As. Soc. Beng. for 1875, pt. 2, p. 203. Scandent; young branches slender, dark-coloured, with sparse minute pale warts. Leaves coriaceous, elliptic, shortly and obtusely cuspidate, remotely and rather minutely serrate, the base rounded; both surfaces glabrous, the upper shining, the lower dull and paler; main nerves ? to 10 pairs, spreading, faint; length 4·25 to 6·5 in., breadth 2·25 to 3·25 in., petiole 35 in. Panicles dichotomously cymose, axillary, shorter than the leaves, about 2 in. in diam. minutely bracteolate, many-flowered. Flowers nearly 15 in. in diam. Calyx cupular, glabrous; the lobes short, broad, blunt. Petals larger than the calyx, orbicular, glabrous. Disc convex, its edge up-turned, glabrous, obscurely 5-angled, almost concealing the ovary. Anthers small, subsessile. Fruit unknown.

Nicobar Islands: Kurz.

6. Hippocratea indica, Willd. Sp. Pl. I, 193. A small glabrous shrub or tree usually with climbing branches; young branches slender, dark-coloured. Leaves thinly coriaceous, elliptic or elliptic-ovate, sub-acute or bluntly cuspidate, the edges finely serrate; the base more or less narrowed, rarely rounded; main nerves about 5 pairs, inconspicuous; length 2.5 to 3.5 in., breadth 1.4 to 1.8 in., petiole .3 in. Punicles umbellately cymose, much-branched, peduncled, spreading, axillary or terminal, usually shorter than the leaves but sometimes much longer, 1 to 3 in. in diam. Flowers .05 in. in diam. Calyx-lobes broadly triangular, the edges hairy. Petals longer than the calyx, sub-erect, oblong, obtuse, concave. Anthers small, sub-orbicular. Ovary broadly

ovoid, glabrous, 3-grooved; stigma sub-sessile, capitate. Carpels usually 2, oblong, blunt, flat, vertically striate, 2 in. long, each with two long winged seeds. DC. Prodr. i. 568; Roxb. Fl. Ind. i. 165; Cor. Pl. ii. t. 130; W. & A. Prodr. 104: Dalz. & Gibs. Bomb. Fl. 32; Thwaites Enum. 52; Oliv. Fl. Trop. Afr. i. 368; Brand. For. Fl. 83; Miq. Fl. Ind. Bat. Vol. I, pt. 2, 599; Lawson in Hook fil. Fl. Br. Ind. I, 624: Kurz For. Flora Burma, I, 256. H. barbata, Mull. Phil. Trans. Inst. Vict. III, 23. H. disperma, Vahl. Enum. II, 28: Wall. Cat. 4210 (in part.). H. euonymoides, Vahl, Enum. II, 98. H. obtusifolia, Wall. (not of Roxb.) Cat. 4211 A and B. H. tortuosa, Wall. Cat. 4126 (in part). Tonsella disperma, Poir. Celastrinea? Wall. Cat. 9013.

Malacca: Griffith, Maingay (Kew Distrib.) No. 396. Singapore; Hullett. Distrib.—Sumatra, Java, British India, Ceylon.

There has been considerable confusion about the Indian species of the genus Hippocratea. The confusion originated to some extent with Wallich who issued, under the name H. obtusifolia, Roxb. and the number 4211, a plant which is really H. indica, Willd. In Mr. Lawson's account of H. obtusifolia Roxb. in Hooker's Flora of British India (I, 623) the following six are reduced to that species, viz., H. barbata, Mull.; H. rigida, Spanoghe; Salacia laevigata, Wight: Hippocratia? grandiflora, Wall. Cat. 4213; H. volubilis, Heyne in Wall. Cat. 4215, and H. tortuosa, Wall. Cat. 4216. Besides Roxburgh's description of H. obtusifolia, in Fl. Ind. I, 166, there is his original coloured figure in the Calcutta Herbarium to guide us as to what plant the author really meant to describe under this name. Moreover, so recently as 1883, there have been collected by Mr. J. S. Gamble at Chengalapalam (in the Nellore district of the Madras Presidency) specimens (Herb. Gamb. No. 12216) of a plant which agree absolutely with Roxburgh's description and figure. These specimens have the short panicles and obtuse emarginate fruits of Roxburgh's figure. Of the six species mentioned by Mr. Lawson, H. barbata, Mull. alone should in my opinion be reduced here, Muller's specimen of it exactly resembling Roxburgh's figure in Herb. Calcutta. Salacia laevigata, Wight (of which there is a coloured figure in Hooker's Bot. Misc. III, 295, Suppl. t. XXXVI) in my opinion more nearly resembles H. Grahamii Wight (Ill. I, 134 and Ic. 380) than H. obtusifolia, Roxb. I have seen no specimen of H. rigida, Spanoghe, but Miquel's description of it (Fl. Ind. Bat. I, pt. 2, 600) does not agree either with Roxburgh's description or with his figure of H. obtusifolia. Of the three Wallichian species, H. grandiflora (Cat. No. 4213) is a perfectly distinct good species which has been described and figured by Korthals (Verh. Nat. Gesch. p. 187 t. 39) as H. macrantha. H. volubilis (Cat. No. 4215) consists of two

things, viz., H. obtusifolia Roxb. and H. Grahamii, Wight; while H. tortuosa, Cat. No. 4216, is a mixture of H. obtusifolia, Roxb. and of H. indica, Willd. To H. Grahamii, Wight, Mr. Lawson (l. c. p. 624) has reduced the plant issued by Wallich as his No. 4214, under the name H. lanceolata, Ham. But in my opinion this reduction is wrong. Under H. Arnottiana, Wight, Mr. Lawson proposes to include Salacia terminalis, Thwaites, which is a tree with cymose panicles on long peduncles much longer than the leaves.

Doubtful Species.

HIPPOCRATEA MAINGAYI, Laws. in Hook. fil. Fl. Br. Ind. I, 625. Branches terete. Leaves coriaceous, lanceolate, glabrous, 3 in. long by '75 in. broad. Cymes 3-flowered, racemose. Carpels triquetrous, woody, 4 to 5 in. long. Seeds oblong, 3.5 to 4.5 in. long.

Malacca: Maingay, (Kew Distrib.) No. 397. DISTRIB. ? Borneo. Known only by Maingay's imperfect descriptions. (The above description is copied from Lawson *l. c.*)

11. SALACIA, Linn.

Scandent or sarmentose shrubs or small trees. Leaves opposite, rarely alternate, petiolate, exstipulate. Flowers few or many, clustered in the axils of the leaves or extra-axillary, more rarely in cymes. Calyx small, 5-parted. Petals 5, imbricate. Stamens 3, rarely 2 or 4, continuous with the disc, recurved. Ovary conical, immersed in the disc, 3-celled; style very short, stigma simple or 3-lobed; ovules 2-8 in each cell, in 1-2 series, inserted on the inner angle. Fruit baccate, 1-3-celled, sub-woody or fleshy. Seeds large, angular.—Distrib. Species about 130; natives of the tropics of both hemispheres.

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Leaves alternate
                                                         ... 1. 8. viminea.
Leaves opposite.
    Flowers solitary or in pairs from the leaf-axils, not on
    tubercles ...
                                                         ... 2. S. Maingayi.
    Flowers in pedunculate axillary cymes.
        Flowers campanuloid; the petals erect in their
        lower half, spreading in the upper
                                                         ... 3. S. campanuloidea.
        Petals spreading from the base.
            Leaves serrate-crenate ..
                                                         ... 4. S. Griffithii.
             Leaves entire
                                                         ... 5. S. Perakensis.
                                               •••
    Flowers from short axillary tubercles.
        Flowers '35 to '45 in. in diam.
             Leaves 6 to 12 in. long.
                 axillary tubercles each bearing 10 or 12
                                                         ... 6. S. Scortcchinii.
                 axillary tubercles bearing only 3 to 6
                 flowers...
                                                        ... 7. S. grandiflora
                                                                 var. longifolia.
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Leaves not more than 6 in. long. Main nerves of leaves 7 to 9 pairs ... 7. S. grandiflora. Main nerves of leaves 4 to 6 pairs ... 8. S. latifolia. Flowers '25 in. in diam. Petals broadly cordate, obtuse, often clawed at the base; flower pedicels '25 to '35 in. long ... 9. S. prinoides. Petals broadly elliptic; flower pedicels '5 to '65 in. ... 10. S. polyantha. Flowers '1 to '15 in. in diam. Leaves broadly elliptic, cuspidate; petals sub-erect, ... 11. S. Wrayi. Leaves oblong-lanceolate; petals orbicular, spreading 12. S. Kunstleri. Leaves oblong or elliptic-oblong, much reticulate and yellowish when dry. Leaves sub-acute; flowers '15 in. in diam., the 13. S. flavescens. Leaves obtuse; flowers '1 in. in diam., disc saucer-like 14. S. Lawsoni. ••• ••• Imperfectly known species. S. Lobbii. S. rubra.

1. Salacia viminea, Wall. Cat.. 7267. A glabrous scandent shrub. Leaves membranous, usually alternate, lanceolate, shortly and bluntly acuminate, entire, the base cuneate; main nerves 5 to 7 pairs, oblique, faint; length 2.5 to 4 in., breadth .8 to 1.5 in., petiole .2 to .3 in. Flowers .15 in. in diam., on thin pedicels .3 in. long, usually solitary or in groups of 2 or 3 (rarely in cymes), from minute bracteolate tubercles, axillary or extra-axillary. Calyx cupular, flat, with 5 triangular concave lobes. Petals 5, rotund or ovate, thin, larger than the calyx-lobes. Disc very convex, fleshy, glabrous, with a pale zone at the base. Stamens 3; the filaments very broad, flat, triangular, erect; anthers transversely obloug, dehiseing by 2 transverse 2-celled apical slits. Ovary sunk in the disc, 3-angled, conical; stigma small. Fruit (young) sub-globular, glabrous. Laws. in Hook. fil. Fl. Br. Ind. I. 627. S. alternifolia Scort. MSS. in Herb. Calc.

Penang; Wallich. Perak; King's Collector No. 374; Scortechini, No. 1811.

The alternate leaves are the best mark of the plants thus named. I think it however possible that two species are included under these alternate-leaved specimens. Those with flowers in short cymes may belong to a different plant from those with flowers solitary or on tubercles. The material is not good; and, in the absence of complete flowering and fruiting specimens, it is difficult to differentiate species of Salacia when the leaves present no good head marks, as the structure of the flowers is very much alike in many species.

SALACIA MAINGAYI, Laws. Hook. fil. Fl. Br. Ind. I, 626. A scandent shrub 6 to 15 feet long; branches rather slender, terete, palebrown when dry and with minute warts. Leaves coriaceous, ovate, elliptic or oblong-elliptic, shortly cuspidate, entire, the base rounded; both surfaces glabrous, shining; main nerves 5 to 7 pairs, slightly prominent on the lower; length 2.5 to 4.5 in., breadth 1.25 to 2.25 in., petiole .25 to ·3 in. Flowers solitary or in pairs, axillary, not on tubercles, ·45 in. in diam., their pedicels stout, about 3 in. long. Calyx fleshy, cupular, with 5 short reniform spreading lobes. Petals 5, much larger than the calvx, oblong or oblong-obovate, sub-rotund, obtuse, rather fleshy, concave, glabrous, spreading. Disc very deep, fleshy, glabrous. Stamens 3, attached to the upper part of the disc; the filaments short, flattened, triangular, recurved and closely applied to the disc; anthers transversely oblong, dehiscing transversely. Ovary conical, 3-angled, sunk in the disc at the base and confluent with it, 3-celled. Style none, stigma with 3 radiating lobes. Fruit unknown.

Malacca; Maingay. Perak; King's Collector Nos. 6639 and 7471.

This resembles S. grandiflora, Kurz, but the flowers are solitary or in pairs from the axils of the leaves, and they are not inserted on tubercles; the petals are also oblong or oblong-obovate. Moreover this is scandent, while S. grandiflora is an erect shrub.

3. SALACIA CAMPANULOIDEA, King, n. sp. A glabrous creeper 50 feet long; young branches 4-angled, slender, pale when dry. Leaves thinly coriaceous, ovate or elliptic-oblong, widest above the middle, the apex obtuse and shortly cuspidate; the edges pale thickened and wavy, crenulate in the lower, remotely serrulate in the upper half, slightly narrowed in the lower third to the base; both surfaces (but especially the lower) pale and often purplish when dry; main nerves 6 to 8 pairs, spreading, faint; length 3 to 4.5 in., breadth 1.35 to 2 in., petiole .3 to ·4 in. Cymes short, axillary, few-flowered. Flowers campanulate, ·15 to ·2 in. in diam. at the mouth, their pedicels about as long as themselves Cymes solitary, axillary, not longer than the or longer, slender. petioles, pedicelled, with numerous bracteoles at the apex where the pedicels are inserted. Calyx fleshy, spreading, deeply divided into 5 transversely oblong obtuse subcrect lobes. Petals 5, fleshy, broadly obovate-elliptic with broad bases, glaucous (especially externally) erect, spreading at the apex so as to form a campanulate corolla. Disc conical with truncate apex, fleshy, pale. Stamens 3, inserted near the upper edge of the disc; the filaments flattened, as long as the ovary, at first erect then recurved horizontally across the disc; anthers large, transversely oblong, 2-celled. Ovary conical, buried in the disc, style rather long, stigma small. Fruit when ripe sub-globular or pyriform, glabrous, 1.5 to 2 in. in diam., sometimes nearly 3 in. long, and of a dark yellowish red colour.

Perak: King's Collector, No. 2708, 3198, 4410, 5953, 6488 and 10747. Scortechini.

4. Salacia Griffithi, Laws. in Hook. fil. Fl., Br. Ind. I, 628. Leaves coriaceous, elliptic-oblong, shortly and bluntly acuminate, the edges serrate-crenate, the base sub-cuneate; both surfaces glabrous, minutely reticulate; main nerves 5 to 7 pairs, ascending, curving; length 4.5 to 5 in., breadth 2 in., petiole 3 in. Cymes solitary, axillary, on peduncles 6 to 75 in. long, divaricating, about 1 in. in diam. Flowers less than 20, 1 in. long, on pedicels shorter than themselves. Calyx puberulous, a shallow cup deeply divided into 5 rotund-ovate concave lobes. Petals 5, erect, much longer than the calyx-lobes, thick, oblong, puberulous, the point slightly inflexed, the apex apiculate. Disc very convex, fleshy, glabrous; stamens 3, inserted on its upper edge; filaments erect, broad; anthers reniform. Ovary buried in the disc. Fruit unknown.

Penang: Curtis No. 692.

5. Salacia Perakensis, King, n. sp. Scandent; young branches dark-coloured when dry, lenticellate. Leaves elliptic, shortly and bluntly acuminate, entire, the base minutely cordate; both surfaces shining, minutely reticulate; main nerves 4 or 5 pairs, ascending, curving, faint, length 2 to 2.75 in., breadth 1 to 1.35 in., petiole 2 in. Cymes axillary; 3 to 45 in. in diam., on pediacles 3 to .75 in. long, 5- to 8-flowered. Flowers 15 in. long, on pedicels shorter than themselves. Calyx cupular, shallow, fleshy, deeply divided into 5 rotund concave lobes. Petals 5, erect, fleshy, oblong, concave, apiculate, puberulous, much longer than the calyx. Disc thick, cylindric. Anthers 3, sessile on the convex apex of the disc, large, transversely oblong, 2-celled. Ovary buried in the disc, conical, stigma minute. Fruit unknown.

Perak: Scortechini, No. 1042.

6. Salacia Scortechini, King, n. sp. A tall robust elimber; young branches rather stout, pale-brown when dry, lenticellate. Leaves coriaceous, opposite, oblong or oblong-elliptic, sometimes slightly obovate, sub-acute, the edges entire, the base usually narrowed but sometimes rounded; both surfaces glabrous, the upper shining, the lower dull, not reticulate; main nerves 6 to 8 pairs, slightly prominent beneath; length 6 to 10 in., breadth 2 25 to 3 5 in.; petioles 6 to 75 in., stout. Flowers 35 in. in diam., glabrous, rather numerous (10 to 12) on very short woody axillary tubercles, their pedicels 35 or 4 in. long. Calyx cupular, divided to the base into 5 shallow broad sub-reniform

lobes. Petals 5, much longer than the calyx, thick, spreading, orbicular. Disc broad, convex, fleshy. Stamens 3, inserted near the apex of the disc; the filaments' broadly triangular, compressed; anthers small. Ovary flat, buried in the disc, the short conical thick style protruding; ovules 3 in each cell. Fruit unknown.

Perak: Scortechini, No. 1848.

This is known only by the late F. Scortechini's scanty specimens. It is a very distinct species.

7. SALACIA GRANDIFLORA, Kurz in Journ. As. Soc. Beng., 1872, pt. 2, p. 300. A shrub or small tree; young branches rather slender, their bark pale when dry. Leaves coriaceous, oblong-elliptic or elliptic. shortly cuspidate, the edges entire, the base slightly narrowed or rounded; both surfaces glabrous, the upper very shining and reticulate; main nerves 7 to 9 pairs, ascending, curved, slightly prominent; length 5 or 6 in., breadth 2.25 to 3.25 in., petiole 5 in. Flowers glabrous, 25 to '45 in. in diam., in groups of 3 to 6 from very short axillary or extraaxillary bracteolate tubercles; their pedicels 2 in. long. Calyx cupular, deeply divided into 5 sub-orbicular fleshy segments. Petals 5, orbicular or obovate-orbicular, concave, spreading. Disc very convex, fleshy, glabrous. Stamens 3, inserted towards the apex of the disc; the filaments broad, triangular, recurved. Ovary buried in the disc, the 3-angled style alone protruding, stigma small. Fruit globular or ovoid, glabrous, 1 to 1.25 in. diam., the calyx and corolla persistent at the base while young, about 1.5 in. long when ripe. Kurz For. Flora Burma, I, 259; Laws. in Hook. fil. Fl. Br. Ind. I, 626.

Malacca: Griffith. Perak: King's Collector, Nos. 5924 and 7579. DISTRIB.—Tenasserim (Kew Distrib.), No. 891.

Kurz describes his S. grandiflora (Journ. As. Soc. Beng., pt. 2, p. 300), as scandent, and as having its flowers on minutely bracteolate axillary or extra-axillary tubercles. He has with his own hand written the name S. grandiflora on various specimens in the Calcutta Herbarium which, although they have all axillary tubercles, shew no evidence of being scandent. These sheets are as follows: - Helfer, Tenasserim or Andamans (Kew Distrib.), Nos. 898 and 891; Griffith, Malacca (without number); and Wall. Cat. No. 2812 from Penang. These in turn agree with various specimens from Penang, Perak, Singapore and Malacca which are described by their collectors as small erect shrubs, and not scandent. The character of being scandent must therefore be eliminated from Kurz's diagnosis of S. grandiflora. In this view Mr. Lawson appears to agree, for he describes both S. grandiflora and S. longifolia Hook. fil. (which I reduce to a variety of S. grandiflora) as erect shrubs. There is however a scandent species very closely resembling the foregoing in leaves, the flowers of which are not on tubercles but arise singly or in pairs from the leaf-axils, and this I have named S. macrantha.

As in the case of *S. flavescens* there is a considerable range in the size of the flowers of *S. grandiflora*, some measuring only '25 in. diam., while others are '45 in. There is also some difference in the shape of the leaves. The specimens with very long, comparatively narrow, leaves have been accepted as a species by Mr. Lawson. But I cannot find that these differ in their flowers from Helfer's No. 898 (Kew Distrib.) which Kurz, the author of this species, has named *S. grandiflora* with his own hand. I therefore treat these as a variety only.

Var. longifolia. Leaves oblong or oblong-oblanceolate, the base much narrowed, 9 to 12 in. long. S. longifolia, Hook. fil. in Fl. Br. Ind. I, 626; Kurz For. Flora Burma, I, 258.

Malacca: Maingay (Kew Distrib.) No. 400². Perak: Wray. DISTRIB.—Tenasserim, Helfer (Kew Distrib.) No. 898. Penang: Curtis, Nos. 134, 1146, 1266, 2939.

SALACIA LATIFOLIA, Wall. Cat. 4222. A scandent glabrous shrub many feet in length; young branches slender, terete, dark-coloured when dry. Leaves thinly coriaceous, elliptic to elliptic-rotund, obtuse or shortly cuspidate, entire, the base rounded; upper surface palegreenish when dry, the lower pale-brown; main nerves 4 to 6 pairs, spreading, forking far from the margin, slightly prominent beneath; length 3 to 6 in., breadth 2 to 3.5 in., petiole .5 in. Flowers .4 in. in diam., in fascicles of 6 to 8 from short axillary tubercles, pedicels about 5 in. long. Calyx cupular, with 5 broad reniform blunt lobes. Petals 5, much longer than the calyx-lobes, obovate, blunt, spreading or recurved. Disc large, thick, glabrous. Stamens 3, inserted near the upper edge of the disc: the filaments long, flat, recurved; the anthers transversely oblong, 2-celled. Fruit globose, smooth, 1 in. in diam.; seeds '75 in. long, semi-convex, slightly rugose. Hook. fil. Fl. Br. Ind. I, 629. S. platyphylla, Kurz in Journ. As. Soc. Beng. for 1875, pt. 2, p. 203.

Singapore; Wallich. Pangkore: Scorteshini, Nos. 39, 951. Andaman and Nicobar Islands.

This is allied to S. prinoides DC., but differs in being a large climber, also in having larger more round leaves and larger flowers and fruit.

9. Salacia princides, DC. Prod. I, 571. A large straggling shrub; young branches divaricating, slender, somewhat four-angled, glabrous. Leaves thinly coriaceous, elliptic-oblong, shortly and obtusely cuspidate, coarsely serrate or entire, the base cuneate; both surfaces glabrous, the lower pale; main nerves 5 or 6 pairs, ascending, curved;

length 1.75 to 3.5 in., breadth 1 to 1.5 in., petiole .15 to .25 in. Flowers ·25 in. in diam., 3 to 6 from small tubercles in the axils of the leaves or from the smaller branches below the leaves; their pedicels slender, about 25 to 35 in. long. Calyx cupular, with 5 rounded concave lobes. Petals much larger than the calyx-lobes, broadly cordate, obtuse, often clawed at the base, the edges membranous. Disc broad, fleshy, convex. Stamens 3, from the upper edge of the disc; the filaments flat but not broad, erect: anthers small, transversely oblong, 2-celled. Ovary small, conical, 3-angled, buried in the disc. Fruit ovoid-globular, 5 in. in diam., 1-celled, 1-sceded. Blume Bijdr. 221; Wall. Cat. 4219: W. and A. Prod. 105: Dalz. and Gibs. Fl. Bomb. 33; Kurz For. Flora Burma, I, 260: Miq. Fl. Ind. Bat. I, pt. 2, p. 597; Hook. fil. Fl. Br. Ind. I, 626. S. podopetala, Turcz. in Bull. Soc. Nat. Mosc. 1863, I, 581. S. Wightiana, Wall. Cat. 4221. Johnia coromandeliana, Roxb. Fl. Ind. I, 169; DC. Prod. I, 571. Tonsella princides, Willd. in Act. Acad. Cur. Ber. IV, 184.

In all the provinces.—DISTRIB: British India, Ceylon, the Malay Archipelago, Philippines.

Var. macrophylla, leaves broadly elliptic, acuminate, much narrowed at the base, 4 to 5 in. long, and 1.75 to 2.75 in. broad. S. macrophylla, Bl. Bijdr. 221.

Perak: King's Collector, 7552; Wray, No. 2133. DISTRIB.—Java.

10. Salacia polyantha, Korth. in Flora XXXI for 1848, p. 379. Scandent, glabrous; young branches dark-coloured when dry, minutely warted. Leaves coriaceous, narrowly elliptic-lanceolate, the apex shortly and obtusely acuminate, the base cuneate, the edges with remote shallow serrations; the upper surface shining when dry and sub-olivaceous, the lower dull brown; length 3.5 to 4.5 in., breadth 1.25 to 2 in., petiole 35 in. Flowers about 25 in. in diam., on slender pedicels 5 to 65 in. long, crowded on very short bracteolate axillary tubercles. Calya flat, fleshy, with 5 rotund slightly imbricate lobes. Petals 5, much larger than the calya-lobes, broadly elliptic, obtuse, concave, spreading. Disc very convex, fleshy, glabrous. Stamens 3, inserted near the upper edge of the disc: filaments flat but not very broad, short, sub-recurved; anthers small, transversely oblong. Fruit unknown.

Tongkah: Curtis, No. 2917. Kedah: Curtis, No. 2574. DISTRIB.—Borneo.

Mr. Curtis describes his Tongkah plant as a climbing shrub and his Kedah plant as a tree; but I cannot find any difference in their flowers or leaves.

11. SALACIA WRAYI, King, n. sp. A stout climber: young

branches slender, glabrous, dark-coloured when dry. Leaves membranous, broadly elliptic, shortly cuspidate, entire, rounded or very slightly narrowed at the base; upper surface shining, darkly cinereous when dry; the lower pale, cinereous, dull: main nerves 6 or 7 pairs, obsolete on the upper, faint on the lower surface when dry; length 1.75 to 2.5 in., breadth 1 to 1.35 in.; petiole .3 to .4 in., slender. Flowers 15 in. in diam., their pedicels about 2 in., in fascicles. of 3 to 6 on very short axillary tubercles shorter than the petioles. Calyx fleshy, sub-campanulate, deeply divided into 5 broad reniform-ovate spreading teeth. Petals sub-erect, twice as long as the calyx-lobes, fleshy, very broadly oblong; the apex obtuse, the base broad and truncate. Disc cupular, fleshy, entire. Ovary broad, depressed, 3angled, surrounded by the disc, stigma small. Stamens 3, spreading; the filaments stout, slightly flattened, recurved over the edge of the disc: anthers small, rounded, 2-celled. Fruit globular, nearly 2 in. in diam., and bright orange when ripe, glabrous, the surface much corrugated when dry especially towards the apex; pedicel very stout, 5 in. long.

Perak: Wray, No. 2542.

12. Salacia Kunstleri, King, n. sp. A scandent shrub; young branches cinereous, glabrous, lenticellate, the bark striate when dry. Leaves membranous, oblong-lanceolate or oblong-oblanceolate, shortly cuspidate, much narrowed to the base, both surfaces glabrous, the lower brown when dry, the transverse reticulations very distinct; main nerves about 7 pairs, spreading and curving upwards; length 3.5 to 5.5 in., breadth 1.75 to 2.3 in., petiole 15 in. Flowers 15 in. in diam., on thin pedicels 5 in. long, in fascicles of 3 to 6 from very small bracteolate axillary tubercles. Calyx small, cupular, spreading, deeply divided into 5 concave ovate-orbicular teeth with coarsely ciliate edges. Petals 5, orbicular, spreading, much larger than the calyx-teeth. Disc flat, thin, annular, not toothed. Stamens 3, attached to the inner edge of the disc; the filaments very broad, triangular, recurved, anthers small. Ovary buried in the disc. Fruit unknown.

Perak: King's Collector, No. 683, (collected only once and probably a rare plant).

13. Salacia flavescens, Kurz, Journ. As. Soc. Bengal, for 1872, pt. 2, p. 300. A scandent shrub 40 to 60 feet long: young branches slender, black when dry and with numerous minute split warts. Leaves opposite, coriaceous, oblong, sub-acute, the edges entire and slightly revolute when dry, the base rounded, almost sessile: both surfaces, but especially the lower, yellowish when dry; main nerves 6 to 9 pairs, spreading, interarching far from the edge: length 4 to 7 in., breadth 1.25 to 2.5 in.; petiole about 2 in., stout. Flowers about 15 in. in

diam., in axillary clusters of 2 or 3 or on very short woody tubercles; pedicels rather longer than the flowers. Calyx of 5 broadly ovate acute concave sepals sometimes with coarsely ciliate edges, otherwise glabrous. Petals twice as long as the sepals, broadly elliptic, glabrous, the inner two sometimes with two imperfect transverse thickened bands on the upper surface. Disc with saucer-like wavy lower rim, the upper part fleshy and confluent with the ovary. Stamens 3, inserted on the disc; the filaments broadly triangular, embracing the ovary: anthers small, transversely elongated, 2-celled. Ovary immersed in the disc, conical, 3-angled, glabrous, the style protruding, the stigma small. Fruit globular, glabrous, 1.5 to 2 in. in diam. Seeds several. Kurz For. Flora Burma. I, 260: Laws. in Hook. fil. Fl. Br. Ind. I, 627. Microtropis coriacea, Wall. Cat. 4338. M. longifolia, Wall. Cat. 4339 (in part). Xanthochymus ovalifolius, Wall. (not of Roxb.) Cat. 4839 B.

Malacca: Maingay (Kew Distrib.), No. 404/2. Perak: King's Collector, Scortechini, Curtis. Penang: Wallich, Curtis, No. 12. Kedah: Curtis, No. 2653. DISTRIB.—Tenasserim, Helfer (Kew Distrib.) No. 897.

Var. dumosa: a small erect shrub; flowers brick-red.

Perak: Scortechini, No. 505, 1734: King's Collector, No. 10948. Kedah: Curtis, No. 2654.

I think it probable that better acquaintance with this shrubby non-scandent variety will prove it to be quite as well entitled to specific rank as many members of this genus.

14. Salacia Lawsoni, King. A scandent shrub with smooth pruinose branches, becoming black when dry. Leaves sub-coriaceous, elliptic, obtuse, entire, the base rounded; both surfaces glabrous, pale yellowish-brown when dry, reticulate, shining: main nerves 6 or 7 pairs, faint; length 2.5 to 5 in., breadth 1.5 to 3 in., petiole 2 to 35 in. Flowers 1 in. in diam., 3 to 6 from small axillary bracteolate tubercles; their pedicels slender, 25 to 3 in. long. Calyx of 5 ovoid-deltoid thick sepals. Petals 5, larger than the sepals, broadly ovoid, obtuse. Disc convex, fleshy. Stamens 3, inserted on the upper edge of the disc; flaments flat, broadly triangular; anthers small, broader than long. Fruit unknown. S. ovalis, Lawson (not of Korth.) in Hook. fil. Fl. Br. Ind. I, 627.

Malacca: Maingay (Kew Distrib.), No. 400.

A species with leaves like those of *S. flavescens* Kurz, but with much smaller flowers: collected only by Maingay. I have been obliged to change the name of this, as there is an earlier *S. ovalis* published by Korthals in 1848 (Flora, XXXI, 579); whereas Mr. Lawson's name dates from 1875.

Imperfectly known species.

Salacia Lobbii, Laws. in Hook. fil. Fl. Br. Ind. I, 626. An erect shrub; branches terete, covered with minute warts. Leaves ellipticoblong with a short obtuse point, entire, not drying black, 3 to 3.5 in. long and 1 to 1.75 in. broad. Flowers 1 to 3 in each axil, thick and fleshy; pedicels stout, 1 to 1.5 in. long. Petals roundly ovate, sub-cordate at the base, 25 in. long. Fruit unknown.

Singapore, Lobb.

This is known only by Lobb's imperfect specimen said to have been collected at Singapore. The description above given is copied from Lawson (l. c.).

Salacia rubra, Laws. in Hook. fil. Fl. Br. Ind. I, 627. A scandent? shrub with coarse pale-coloured branches. Leaves sub-coriaceous, elliptic-lanceolate or ovate-lanceolate, acuminate, entire, the base cuneate, both surfaces glabrous, the lower paler; main nerves 5 pairs. Flowers unknown. Fruit globose, bright red when ripe, rugose, 1.5 in. in diam., 2-seeded.

Malacca: Maingay (Kew Distrib.), Nos. 398/2 and 1525. The above description is taken from Lawson (l. c.)

ORDER XXXII. RHAMNEÆ.

Shrubs or trees, erect or scandent (cirrhose in Gouania). Branches unarmed spinous or aculeate. Leaves simple, alternate, or rarely opposite, usually coriaceous, often 3-5-nerved; stipules small, deciduous or changed into prickles. Flowers hermaphrodite or polygamous, small, greenish, in cymes which are solitary or disposed in spikes or panicles. Calyx 4-5-fid; lobes triangular, erect or recurved, usually carinate within, valvate. Petals 4-5, rarely 0, inserted on the throat of the calyx-tube, usually shorter than its lobes, cucullate or involute. Stamens 4-5, inserted with the petals and opposite to them, often enclosed within their folds; anthers versatile, 2-celled, dehiscing longitudinally. Disc fleshy and filling the calyx-tube, or thin and lining it, entire or lobed, glabrous, rarely tomentose. Ovary sessile, free or immersed in the disc, wholly free from the calyx-tube or more or less adherent to it, 3- rarely 2-4-celled; style short, simple, or 2-4-cleft; ovules 1 in each cell, erect, anatropous, raphe dorsal. Fruit free or girt at the base or middle by the adhering calyx-tube, 3- more rarely 1-4-celled, capsular and often winged, or drupaceous. Seed with fleshy albumen, rarely exalbuminous; embryo large, erect.—DISTRIB. tropical and temperate regions; species about 420.

Fruit superior. Armed trees or shrubs; fruit drupaceous ... 1. Zizyphus. Fruit half inferior. Unarmed erect shrubs; fruit dry, 3-celled, 3-seeded 2. COLUBRINA. Scandent unarmed shrubs; fruit dry, 1-celled, 1-seeded (by abortion), epicarp prolonged into a long apical wing. Fruit indehiscent, apical wing not splitting 3. VENTILAGO. Fruit dehiscent, apical wing splitting at least at the base 4. SMYTHEA. Fruit inferior, crowned by the persistent calyx, 3-winged or triquetrous ... 5. GOUANIA. •••

1. Zizyphus, Juss.

Trees or shrubs, often decumbent or sarmentose and usually armed with sharp, straight or hooked prickles (transformed stipules). Leaves alternate, 3-nerved, usually coriaceous. Flowers fascicled, or in sessile or pedunculated cymes. Calyx 5-fid; lobes spreading, keeled within; tube broadly obconical. Petals 5, rarely 0, cucullate, deflexed. Disc 5-10-lobed, flat or pitted, with a free margin. Stamens 5. Ovary sunk in the disc and confluent with it at the base, 2-4-celled; styles 2-4, free, or more or less united. Fruit fleshy or dry, with a woody or bony 1-4-seeded 1-4-celled stone. Seed plano-convex, albumen 0, or very scanty.—Distrib. Species about 60, found in tropical Asia and America, and in the temperate regions of both hemispheres.

Leaves pubescent underneath.

Leaves uniformly tomentose beneath, broadly ovate or sub-orbicular, blunt; drupe glabrous, with much pulp and bony endocarp 1. Z. Jujuba. Leaves rusty-pubescent beneath, ovate lanceolate, oblique, acute; drupe glabrous, with scanty pulp and leathery endocarp 2. Z. Oenoplia. Leaves rusty-pubescent beneath, elliptic-oblong, acute or shortly acuminate, cordate; drupe rufous-tomentose, with thin pulp and bony endocarp 3. Z. Kunstleri. Leaves sparsely pubescent beneath, ovate-lanceolate, oblique, bluntly acuminate; drupe glabrous, with thin pulp and leathery endocarp ... 4. Z. elegans.

Leaves glabrous on both surfaces.

Cymes in thyrsoid terminal panicles, fruit 5. Z. calophylla. tomentose Cymes axillary. Sepals connivent, disc pitted, drupe glabrous 6. Z. affinis.

Sepals spreading, disc not pitted.

Lateral nerves of leaves either unbranched, or very faintly so, drupe glabrous 7. Z. glabra. One at least of the lateral nerves strong-

ly branched, drupe tomentose 8. Z. Horsfieldii.

1. ZIZYPHUS JUJUBA, Lamk. Dict. III, 318. A small tree: young branches, flowers and under surfaces of leaves more or less pale or tawny-tomentose. Leaves ovate-elliptic, ovate or sub-orbicular, blunt, sub-entire, somewhat narrowed at the base, upper surface glabrous; length 1 to 2 in., breadth 5 to 1.15 in.; prickes solitary or in pairs: petiole '25 to '5 in. Cymes short, lax or dense, axillary. Calyx flocculent outside, glabrous inside. Petals sub-spathulate, concave. Disc with 10 grooved lobes. Ovary glabrous, 2-celled; styles united to the middle. Fruit globose or ovoid, glabrous, fleshy, 5 to .75 in. in diam., yellow or orange-vellow, stone 1- or 2-celled. DC. Prodr. ii. 21; Roxb. Fl. Ind. i. 608; Wall. Cat. 4244; W. & A. Prodr. 162; Wight Ic. t. 99; Hook. Journ. Bot. i. 320, t. cxl. (1834); Dalz. & Gibs. Bomb. Fl. 49; Thwaites Enum. 74; Bedd. Fl. Sylvat. t. cxlix.; Hook. fil. Fl. Br. Ind. I, 632: Kurz For. Flora Burma, I, 266; Boiss. Fl. Orient. ii. 13; Brandis For. Flor. 86, t. 17; Trimen Fl. Ceyl. I. 280. Z. mauritiana, Herb. Ham. in Wall. Cat. 4245; DC. Prodr. ii. 21. Z. Sororia, Schult. Syst. v. 337; DC. Prodr. ii. 21. Z. trinervius, Roth Nov. Sp. 168, excl. var. β . Rhamnus Jujuba, Linn. Fl. Zeyl. 36; Rheede Hort. Mal. iv. t. 40.

Malacca and Province Wellesley, but probably introduced. DISTRIB. India, Affghanistan, Ceylon, China, Australia, Africa.

A widely distributed species, and therefore presenting considerable variety. The description above given refers to the plant as found in the Malay Peninsula. As a rule there are two stipular prickles, of which one is straight and the other curved. The fruit is eaten and several garden forms are found.

2. ZIZYPHUS OENOPLIA, Mill. Gard. Dict. No. 3. A scandent or straggling shrub; young branches rusty-tomentose; prickles solitary, tomentose at the base, glabrous at the apex, short, recurved. Leaves ovate-lanceolate, often very oblique, acute, entire or obscurely crenateserrate, with 3 bold vertical nerves and numerous connecting ascending

branches; upper surfaces sparsely strigose, the lower densely rufescentvillous: length 1.25 to 2.25 in., breadth .7 to 1.2 in.; petiole .2 to .3 in., tomentose. Cymes slightly longer than the petioles, subsessile, 12-to 15flowered, pubescent. Calyx sparsely pubescent outside, glabrous inside. Disc glabrous, with 10 short deeply pitted lobes. Styles united to the apex. Drupe globular, slightly compressed, black, glabrous, shining, with scanty pulp, '25 in. in diam., endocarp leathery. DC. Prodr. ii. 21; Roxb. Fl. Ind. i. 611; Wall. Cat. 4246; Don Prodr. 190; W. & A. Prodr. 163; Dalz. & Gibs. Bomb. Fl. 49; Thwaites Enum. 74; Hook. fil. Fl. Br. Ind. I, 634; Kurz For. Flora Burma, I, 266; Bedd. Fl. Sylv. Anal. Gen. lxix.; Brandis For. Fl. 86. Z. albens, Roxb. Fl. Ind. i. 607. Z. celtidifolia. DC. Prodr. ii. 20; Miq. Fl. Ind. Bat. I, pt. 2, p. 641). Z. ferruginea, Heyne in Wall. Cat. 4246, B, in part. Z. Napeca, Roxb. Fl. Ind. i. 612, not Willd.; Roth Nov. Sp. 159. Z. pallens, Wall. Cat. 4247? Z. pedicellata, Wall. Cat. 4243. Z. rufula, Miq. Fl. Ind. Bat. i. 643. Z. scandens, Roxb. Hort. Beng. 17; Wall. Cat. 7269. Rhamnus Œnoplia, Linn. Sp. Pl. 282.

In all the Provinces; common.—DISTRIB., British India, Ceylon: tropical Asia and Australia.

In Perak there is a form of this (King's Collector Nos. 5106 and 5276) with leaves rather larger than the measurements above given, and nearly glabrous.

3. ZIZYPHUS KUNSTLERI, King n. sp. A scandent or straggling shrub: young shoots rusty-pubescent; spines stout, solitary, decurved. Leaves coriaceous, elliptic oblong, acute or shortly acuminate, very finely serrate, narrowed to the minutely cordate base; upper surface shining, glabrous except the impressed rusty-pubescent nerves; the lower dull, rusty-pubescent especially on the 3 main vertical nerves and their lateral branches; length 4 to 6 in., breadth 2 to 3 in., petiole 15 to 2 Cymes 5- to 8-flowered, sub-sessile and crowded on branches 4 to 10 in long, many of them in the axils of leaves much smaller than those of the stem. Calyx rusty-tomentose outside, glabrous inside; its teeth broadly triangular, acute, spreading. Disc with 5 broad truncate emarginate teeth, glabrous except a villous elevated ring surrounding the base of the sunk tomentose ovary. Styles united for half their length. Drupe ovoid, slightly compressed, rufous-tomentose, the persistent calyx reflexed; 1 to 1.25 in. long, and from '5 to '75 in. diam.; pulp scanty, endocarp woody; seed single, compressed.

Province Wellesley, King's Collector No. 1607. Perak: Wray, Nos. 1911, 3281 and 3285; King's Collector Nos. 3772 and 6853.

A very distinct species, the flowering branches of which have much smaller leaves than those of the barren branches. Named in memory

of its first collector, H. H. Kunstler, who sent it from Province Wellesley in 1881.

4. ZIZYPHUS ELEGANS, Wall. Cat. 4233. A straggling or scandent shrub: young branches slender, softly pubescent. Leaves ovate-lanceolate, bluntly acuminate, oblique, the edges obscurely glandular-serrate-crenate, the base slightly narrowed; upper surface glabrous except the pubescent nerves; the lower sparsely pubescent especially on the nerves; the middle of the 3 main bold vertical nerves unbranched, one, and sometimes both, of the lateral sending a few faint branches from one side; length 2 to 3 in., breadth 75 to 1.25 in.; petiole 25 to 35., tomentose. Cymes with stalks as long as the leaves, dichotomous, 20-30-flowered, tomentose. Calyx adpressed-pubescent outside, glabrous inside. Disc glabrous, fleshy, with 5 broad emarginate lobes, each lobe with 3 deep pits; styles short, slightly united. Drupe sub-globular, compressed, glabrous, 3 in. in diam., pulp very thin, endocarp leathery. M. subquinquenervius, Miq. Fl. Ind. Bat., Suppl. 330.

Singapore; Wallich, King's Collector. Malacca; Ridley No. 1504. Maingay (Kew Dist.) No. 412. Perak: King's Collector, No. 4260 and 4770—DISTRIB.; Sumatra, Forbes 3137; Diepenhorst.

This species was first described by Miquel from specimens collected at Prianam in Sumatra, one of which is in Herb: Calcutta. Miquel does not describe the fruit, which differs from that of Z. Horsfieldii of the same author in being smaller and glabrous. This is no doubt very closely allied to Z. Horsfieldii, and it would have been better had Miquel transposed the names of the two; for there is much more disposition to an increase in the number of the newes of the leaves in Z. Horsfieldii than in Z. subquinquenervis. Wallich had however, long prior to the publication of Miquel's name for this, issued leafless twigs of it as No. 4233 of his Catalogue, under the name Z. elegans; and this name must therefore, as the earliest, be adopted.

5. Zizyphus calophylla, Wall. in Roxb. Fl. Ind., ed. Carey, II, 366. A powerful climber; young branches dark-coloured, rusty-puberulous or glabrous, sparsely lenticellate; prickles short, recurved, usually solitary, rarely in pairs. Leaves coriaceous, elliptic or elliptic-oblong, shortly and obtusely acuminate, the edges minutely crenatedentate or sub-entire; the base usually narrowed, not oblique; both surfaces glabrous, shining, the upper pale, olivaceous; main nerves 3, bold, unbranched, vertical; length 3 to 5 in., breadth 1.5 to 2.5 in., petiole 25 to 35 in. Cymes rusty-pubescent, disposed in axillary or terminal thyrsoid panicles. Calyx rusty-tomentose outside, glabrous inside; its teeth broadly triangular, acute, spreading. Disc entire. Styles united to near the apex. Drupe minutely rufous-tomentose,

ovoid or ovoid-globose, the pulp scanty and the endocarp leathery, seed solitary. Wall. Cat. 4230; Hook. fil. Fl. Br. Ind. I, 636. Z. ornata, Miq. Fl. Ind. Bat., Vol. I, pt. I, 642. Berchemia calophylla, G. Don Gen. Syst. II, 28.

Penang; Wallich. Malacca; Griffith, No. 2046. Maingay (Kew Distrib.), No. 411. Perak, common. Singapore; Ridley, Nos. 1915, 4939. Pahang, Ridley, No. 5021. Selangor, Ridley's Collector.

A handsome and very distinct species. Ridley's Singapore No. 3646 seems to be a form of this with smaller leaves and more globular smaller fruit than usual. Z. ornata, Miq., of which there is a type specimen in Herb. Calcutta, differs in no respect from this.

6. ZIZYPHUS AFFINIS, Hemsley in Hook. Ic. Pl. t. 1544. Scandent: young branches dark-coloured, glabrous, the older often with many prominent lenticels, prickles and leaves as in Z. calophylla. Cymes solitary, axillary, on pedicels longer than the petioles, spreading, many-flowered, puberulous. Flowers sub-globular, opening only slightly; the calyx coriaceous, rugulose and sub-glabrous externally; its lobes broadly ovate, very concave, erect, with incurved apices lined internally with a pale glabrous membrane. Disc minutely 10-crenate, pitted, glabrous. Styles united to the apex. Fruit ovoid, glabrous, '75 in. long and 6 in. in diam., the pulp scanty and the endocarp bony.

Perak: Wray Nos. 1885, 1886 and 1995. King's Collector Nos. 3568, 3747, 5238, 5528, 6720. Scortechini No. 192.

The leaves of this species so much resemble those of Z. calophylla Wall., that its author, who had very scanty material to work with, expressed some doubt whether it should not be considered as a variety of that species, rather than as a distinct one. Au examination of numerous specimens with good flowers and ripe fruit, shows however that it is perfectly distinct from Z. calophylla. Its calyx differs in fact very much from that of any other Asiatic species of this genus known to me, inasmuch as the lobes are coriaceous, cucullate, connivent and lined by a pale membrane.

7. ZIZYPHUS GLABRA, Roxb. Fl. Ind. I, 614. A scandent shrub; young branches puberulous; spines short, curved, solitary. Leaves ovate-oblong, rarely ovate-lanceolate, shortly and obtusely candate-acuminate, the edges serrulate or sub-entire, the base slightly narrowed, oblique, and sometimes emarginate on one side, boldly 3-nerved, nerves unbranched, both surfaces shining, glabrous except the midrib on the upper which is pubescent; length 2.5 to 3.5 in., breadth 1.25 to 1.6 in., petiole 2 to 4 in. Cymes slightly longer than the petioles, on short stalks, axillary, spreading, 10- to 20-flowered, pubescent like the outer-surface of the calyx. Disc with a circular hairy centre and glabrous edge with 10

obscure broad teeth. Drupe round or ovoid, at first puberulous, when quite ripe yellow and usually nearly glabrous, '5 or '6 in. in diam., stone usually 1-celled. Kurz For. Flora Burma, I, 267. Z. venulosa, Wall. Cat. 4235.

Andaman and Nicobar Islands.—DISTRIB. Burma, Chittagong.

This is a perfectly good and distinct species. Mr. Lawson however, misled no doubt by Wallich's wrong identification of No. 4242 of his catalogue as Z. glabra, Roxb., and in the absence of an authentic specimen of the species, reduced this (in Hooker's Flora of Brit. India I, 636,) to a glabrous form of Z. rugosa Lamk., which is a plant with a totally different inflorescence. The nearest ally of this is undoubtedly the Indian Peninsular species Z. trinervia Roxb., which was published by Roxburgh in his Hortus Bengalensis in 1813 as Z. trinervius, and of which a full and excellent description was given as Z. trinervia in his Flora Indica I, 606. The synonymy of this species is rather curious, and I therefore make a note of it here. Roth described what is undoubtedly a different plant in his Novæ Plantarum Species (published in 1821) as a species of his own under the name Z. trinervius, and of that plant he describes, as var. glabratus, a form to which he reduces Z. glabratus Heyne, which is unmistakably the Z. trinervius of Roxburgh; I can find no other publication of Heyne's Z. glabratus than this one of Roth's. Unfortunately Mr. Lawson has taken Heyne's name as that of the species, although Roxburgh's dates from 1813.

8. Zizyphus Horsfieldii, Miq. Fl. Ind. Bat., Vol. I, pt. 1, p. 643. Young branches sparsely puberulous; spines short, curved, usually solitary or with a second abortive. Leaves ovate-elliptic or ovate-lanceolate, acuminate, minutely serrate, the base slightly narrowed, sometimes oblique or sub-cordate, glabrous on both surfaces, the latter with a few scattered hairs on the nerves; vertical nerves 3, bold, impressed on the upper and prominent on the lower surface, the middle one unbranched, the two lateral sending bold curved ascending branches towards the margin; length 2.5 to 3 in., breadth 1 to 1.75 in., petiole 3 to 5 in. Cymes longer than the petioles, branched, few-flowered. Flowers on pedicels longer than themselves; calyx puberulous outside, glabrous inside: disc tomentose with a glabrous 10-crenate wavy edge, not pitted; styles united to the apex. Fruit globular, slightly compressed, 5 to 6 in. in diam., densely but minutely tawny-tomentose.

Nicobar Islands: Kurz. Singapore, Ridley, No. 6379.—DISTRIB. Java.

This species much resembles Z. glabra, Roxb., but the outer nerves of the leaves are boldly branched outwards, and the fruit is minutely tomentose. The specimens of this are scanty. When more materials

of this and of Z. glabra, Roxb. are obtained, it may be found impossible to keep this up as more than a variety of the older species. Ridley's Singapore specimens (No. 6379) have longer-stalked cymes than those from the Nicobar Islands or from Java. In the latter the cymes do not much exceed the petiole in length, while in the former they are, even when in flower, half as long as the leaf.

2. COLUBRINA, Rich.

Erect shrubs. Leaves alternate. Flowers in very short axillary cymes. Calyx 5-fid; tube hemispherical. Petals 5, clawed, springing from the margin of the disc, hooded. Stamens 5. Disc fleshy, filling the calyx-tube. Ovary sunk in the disc and confluent with it, 3-celled; style 3-cleft; stigmas reflexed. Fruit the size of a pea, subglobose, surrounded below the middle by the remains of the calyx-tube, 3-celled, cells 1-seeded, tardily dehiscent.—Distrib. Species 18, chiefly tropical American.

Leaves broadly ovate, crenate-serrate ... 1. C. asiatica. ,, oblong-oblanceolate, entire ... 2. C. anomala.

1. Colubrina asiatica, Brongn. in Ann. Sc. Nat. Ser. 1, x, 369. A glabrous unarmed shrub. Leaves broadly ovate, acute, crenate-serrate, (sometimes obscurely), rounded at the base; main nerves about 3 pairs, curved, ascending; length 1.5 to 3 in., breadth 1 to 2.25 in.; petiole 4 to 6 in., slender. Cymes shorter than the petioles, flowers yellowish. W. & A. Prodr. 166; Wight Ill. i. t. 74; Dalz. & Gibs. Bomb. Fl. 50; Thwaites Enum. 75; Hook. fil. Fl. Br. Ind. I, 642; Kurz For. Flora Burma, I, 268; Bedd. Fl. Sylv. Anal. Gen. lxix. C. javanica, Miq. Fl. Ind. Bat. vol. I, pt. 1, 649. Ceanothus asiaticus, Lamk Ill. t. 129, f. 2; DC. Prodr. ii. 30; Roxb. Fl. Ind. i. 615; Wall. Cat. 4262. C. capsularis, Forst. Prodr. 18; DC. Prodr. ii. 32. Pomaderris capsularis, G. Don Gen. Syst. ii. 39; Burm. Zeylan. t. 48. Rhamnus acuminata, Colebr. in Roxb. Fl. Ind. i. 615.

Pahang, Perak, Nicobar and Andaman Islands.—DISTRIB.; Malay Archipelago, British India.

2. COLUBRINA ANOMALA, King n. sp. A tree 30 to 40 feet high with spreading pendent branches; young shoots softly rusty-puberulous. Leaves oblong-oblanceolate, caudate-acuminate, entire, much narrowed to the base: upper surface glabrous, shining; the lower puberulous, liver-coloured when dry; main nerves 4 pairs, slightly curved, ascending, the lowest pair springing from the very base: length 4 to 6.5 in., breadth 1.1 to 2.25 in., petiole 4 to 5 in. Cymes axillary or crowded on the branches between the leaves, branching, many-flowered, rusty-tomentose, minutely bracteolate. Flowers 15 in. in

diam., on pedicels longer than themselves. Calyx sparsely puberulous outside, its lobes triangular, glabrous and keeled inside. Disc glabrous, thick, filling the calyx tube; ovary glabrous, 3-celled, the styles short, distinct, sometimes slightly reflexed. Fruit on a thin glabrous pedicel elongated to nearly 1 inch, depressed-globular, glabrous, '25 in. in diam., black when dry, the withered calyx teeth forming a ring above its base.

Perak: King's Collector, Nos. 6561 and 7476.

This plant differs from the other species of the genus in the character of its foliage, and in the fact that the styles are quite short, and not united. The flowers, however, in other respects, and the fruit, are exactly those of the genus.

3. VENTILAGO. Gaertn.

Scandent shrubs with alternate leaves. Flowers small, panicled, minutely bracteolate. Calyx obconic, 5-fid; the teeth spreading, keeled internally. Petals 5, deltoid or obcordate, deflexed, cucullate. Stamens 5, adnate to the petals at the base. Disc 5-angled, its margin free. Ovary immersed in the disc, 2-celled, the style very short. Ripe fruit subglobose, 1-celled, 1-seeded, surrounded at its base or middle by the adherent calyx-tube, the fruit prolonged upward above the seed-chamber into a linear or linear-oblong coriaceous apical wing. Seed sub-globose, exalbuminous.—Distrib. Species about 16; tropical.

Fruit pubescent 1. V. Madraspatana. Fruit glabrous.

Leaves sub-acute, with 8 to 11 pairs of main nerves, fruit 25 to 35 in. in diam.... 2. V. Maingayi. Leaves more or less shortly caudate-acuminate, with 6 or 7 pairs of main nerves... 3. V. leiocarpa.

1. Ventilago madraspatana, Gaertn. Fruct. I, 223, t. 49, p. 2. Young branches and panicles pubescent. Leaves oblong-ovate to ovate, sub-acute, the edges entire or obscurely sinuate in the upper half, the base rounded; main nerves 4 to 6 pairs, alternate, ascending; upper surface glabrous, the lower glabrous or puberulous; length 2·25 to 5 in., breadth 1·25 to 2·25 in.; petiole ·25 to 6 in. Panicles terminal and axillary, longer than the leaves, narrow, with distant short manyflowered cymose branches. Flowers about ·15 in. in diam., shorter than their pedicels, densely crowded. Calyx pubescent or puberulous outside, glabrescent inside; disc velvetty. Ovary tomentose, styles more or less divergent. Fruit yellowish, densely pubescent, often becoming sub-glabrous with age; the nut about ·2 in. in diam.; the wing 1-nerved, blunt, 1·75 to 2·25 in. long and ·3 to ·4 in. broad. V. calyculata, Tulasne in Ann. Sc. Nat. Ser. 4, VIII. 124; Brandis For. Flora 96; Lawson in

Hook, fil. Fl. Br. Ind. I, 631; Kurz For. Flora Burma. I, 262. V. denticulata, Willd. Nov. Act. Ber. iii. 417; DC. Prodr. ii. 38. V. macrantha, Tulasue in Aun. Sc. Nat. Ser. 4, viii. 123. V. macraspatana, Roxb. Fl. Ind. i. 629; Cor. Pl. i. 55, t. 70; Wall. Cat. 4268, in part. W. & A. Prodr. 164. V. silhetiana, Smithiana, and sulphurea, Tulasue in Ann. Sc. Nat. Ser. iv-viii. 125.

South Andaman.—DISTRIB. Throughout the hotter parts of India and Java.

Tulasne was the first to establish V. calyculata as a species, and he founded it upon three Indian specimens, viz., Herb. Strachey and Winterbottam No. 349, Wall. Cat, 4268G. (both from Kamaon) and Wall. Cat. 4268H. (from Sylhet). The characters used by him to distinguish V. calyculata as a species distinct from the older V. madraspatana, Gaertn. are that the latter has more slender and more glabrous panicles; that the ovary is less hairy and the styles less divergent; the wing being attached to the base of the fruit in V. madraspatana, while it springs from about the middle of it in V. calyculata. The last character is the one most relied upon; but, as regards it, I find no degree of constancy. I do not think the form named calyculata deserves rank as more than a variety of typical V. madraspatana Gaertn., the synonymy of which (as distinct from this variety) is as follows: Brongn. Mem. sur la Fam. des Rhamnées, Ann. Sc. Nat. for 1827, Ser. I (Vol. X) p. 358, t. 12, fig. IV; W. & A. Prodr. 164; Wight Ic. 163; Wall. Cat. 4268, in part; Dalz. & Gibs. Bomb. Fl. 48; Thwaites Enum. 74; Brandis For. Fl. 96; Laws. in Fl. Br. Ind. I, 631. V. bracteata, Wall. Cat. 4269.

The typical form seems to occur only in Southern India and Ceylon. 2. Ventilago Maingayi, Laws. in Hook. fil. Fl. Br. Ind. I, 631. Young branches and panicles puberulous. Leaves thinly coriaceous, glabrous, oblong or oblong-lanceolate, sub-acute, entire, the bases narrowed; main nerves 8 to 11 pairs, spreading; length 2.5 to 4.5 in., breadth 1.25 to 1.75 in., petiole 1 to 2 in. Panicles narrow and spikelike, shorter than the leaves when in flower, longer when in fruit; the branches very short, distant, cymose. Flowers crowded; 1 in. in diam., about as long as their pedicels. Calyx puberulous outside, glabrous inside, the keels of its lobes very bold. Disc pubescent. Ovary glabrous. Fruit greenish-yellow, glabrous; the nut 25 to 35 in. in diam.; the wing blunt, 1-nerved, mottled with red, 3 to 3.5 in. long and about 6 in. broad. Kurz For. Flora Burma, I, 263.

Malacca: Maingay (Kew Dist.) No. 407; King's Collector, No. 7721. DISTRIB. Tenasserim? Cambodia!

A species easily recognised by its elongated entire thinly coriaceous leaves, and long-winged glabrous fruit. Tenasserim is given as a local-

ity for this species by its author; but if this distribution be given on the strength of Helfer's Tenasserim specimen No. 2022 (Kew Distrib.), I think it is erroneous: for that specimen does not agree with Maingay's (from Malacca) No. 407 which is the type of the species.

3. VENTILAGO LEIOCARPA, Benth. Fl. Hongkong 67; Journ. Linn. Soc. V, 77. Young shoots angled and, like the inflorescence, puberulous. Leaves thinly coriaceous, glabrous, ovate-oblong, more or less shortly caudate-acuminate; the edges more or less minutely crenate-serrate, sometimes entire, except at the rounded or slightly narrowed base: main nerves 6 or 7 pairs, curved, ascending; length 2.25 to 3.5 in., breadth 1 to 1.1 in., petiole 2 in. Panicles very narrow and spike-like, much longer than the leaves even when only in flower; their lateral branches distant, very short, cymose. Flowers shorter than their pedicels, '1 in. to '125 in. in diam. Calyx and disc glabrescent. Fruit golden yellow, glabrous: nut about '2 in. in diam.; the wing with several vertical nerves, blunt, from 2 to 2.5 in. long and .4 (rarely .75 in.) broad. Lawson in Hook fil. Fl. Br. Ind. I, 631; Kurz For. Flora Burma, I, 263. V. madraspatana, Benth. (not of Gaertn.) in Hook. Kew Journ. IV, 42.

Singapore: Ridley, No. 3607. Malacca; Maingay (Kew Distrib.) 406; Griffith (Kew Distrib.), Nos. 2022 and 2026. Perak; King's Collector, Nos. 6573, 7758; Wray, Nos. 2276, 2335. Scortechini, No. 2110.—DISTRIB. Sumatra, Java, Hongkong. A common plant.

In a few specimens the flowers are arranged in small axillary cymes: but, by the fall of the leaves, the inflorescence would be converted into narrow spikes of cymes as above described. Some of the specimens from Perak have entire leaves as much as 8 in. long and 2.5 in. broad; and these may belong to a distinct species. The species is readily distinguished by its crenate-serrate shining glabrous leaves, and by its glabrous several-nerved fruit-wings. A species from Sumatra described by Miquel (Fl. Ind. Bat. Suppl. 330) under the name of V. lucens must be very near to, if not identical with this. If it be identical, the name V. lucens (published in 1860) must take precedence of Bentham's name which was not published until 1861.

SMYTHEA, Seem.

Scandent or sub-scandent unarmed woody shrubs. Leaves alternate, petiolate. Flowers in axillary fascicles, or on leafless terminal branches which form lax panicles. Calyx-tube obconic; the lobes 5. spreading. Petals 5, cucullate, broadly emarginate or 2-lobed. Stamens 5, not covered by the petals; the anthers incurved, didymous. Disc 5-angled. Ovary half-inferior, 2-celled: styles 2, recurved. Capsule with the calvx adherent to its base, ovate-lanceolate, compressed, produced above the seed-cavity into a much elongate leathery wing, 1-celled, 1 seeded, dehiscing vertically into 2 valves. Seed solitary, large, compressed, exalbuminous.—Distrib. Four species, Malayan and Polynesian.

The differences between the genera Smythea and Ventilago lie entirely in the fruit. Both have 2-celled ovaries with two styles, and in both only one ovule becomes a seed. In both the epicarp of the fruit is prolonged above the apex of the seed-chamber into a long coriaceous wing with a vertical midrib. In Ventilago the fruit never dehisces, and the wing never divides. In Smythea the seed-chamber dehisces vertically along its dissepiment, and the wing separates to some extent, from below upwards and along the mesial line, into two pieces. In Ventilago the mesial line has the appearance of the midrib of a leaf, being quite single: in Smythea the mesial line consists, in its lower part at least, of two parallel sets of fibro-vascular bundles.

Leaves entire, much and conspicuously reticulate 1. S. reticulata.

Leaves serrate, widest above the middle; disc and ovary glabrous 2. S. macrocarpa.

Leaves remotely crenate-serrate, widest below the middle; disc and ovary minutely tomentose 3. S. calpicarpa.

1. SMYTHEA RETICULATA, King n. sp. Young branches puberulous. Leaves ovate-elliptic or lanceolate, shortly acuminate, entire, with minutely cordate or rounded bases, glabrous, shining and minutely reticulate on both sides; main nerves 4 or 5 pairs, faint; length 2 to 3 in., breadth '8 to 1.5 in.; petiole '1 in., glabrous. Fascicles 12-to 15-flowered; flowers '15 in. in diam. Calyx sparsely pubescent outside, glabrous inside, its lobes erect, neither lobed nor pitted. Ovary tomentose. Fruit lanceolate, acuminate, minutely cinereous-tomentose, 2 in. long and '8 in. broad.

Singapore: Ridley, No. 3592. Johore: Ridley, 1917. Perak: Scortechini, No. 1008.

Distinguished by its entire perfectly glabrous very reticulate leaves, glabrous petiole, hairy ovary, and lanceolate acuminate fruit.

2. Smythea macrocarpa, Hemsley in Hook. Ic. Pl. t. 1558. Young branches slender, rufous-puberulous. Leaves oblong-oblanceolate to obovate-elliptic, acuminate, serrate, narrowed to the slightly oblique base; both surfaces glabrous; main nerves 6 to 9 pairs, slightly curved, ascending; length 2.5 to 5 or even 7 in., breadth 1 to 1.5 or even 2 in.; petiole 1 to 2 in. or none. Fascicles about 10-flowered; the flowers 15 in. in diam., pedicellate. Calya sparsely pubescent outside, glabrous inside; its 5 lobes triangular, thick. Disc glabrous, neither lobed nor pitted. Ovary glabrous. Fruit leathery, oblong, obtuse, with one stout vertical double line along which dehiscence takes

place and several faint lateral lines, about 3 in. long and 5 to 75 in. broad. Ventilago macrocarpa, King MSS.

Perak: common. Penang: Curtis, No. 1751.

 ${
m Var.}\ pubescens,\ {
m young}\ {
m branches}\ {
m tomentose}\ ;\ {
m leaves}\ {
m pubescent}\ {
m on}$ the under surface.

Perak: Scortechini, No. 2110; King's Collector, No. 7726.

3. SMYTHEA CALFICARPA, Kurz Journ. As. Soc. Bengal, Vol. XLI, (for 1872) pt. 2, p. 301; For. Flora Burma I, 264. Young branches sparsely tawny-pubescent. Leaves lanceolate, acuminate, remotely crenate-serrate; both surfaces glabrous but for a few scanty hairs on the 5 or 6 pairs of ascending slightly curving lateral nerves; length 2·25 to 2·75 in., breadth 'S to I in.; petiole '15 in., tomentose. Fascicles 3-to 10-flowered; the flowers '15 in. in diam., pedicellate. Calyx hirsute outside; disc and ovary minutely tomentose. Fruit (unripe) coriaceous, oblong, obliquely truncate at the apex, minutely tawny-tomentose.

Andaman Islands: Helfer (Kew Distrib.), No. 2026/1; King's Collectors.

5. GOUANIA, Linn.

Unarmed climbing shrubs. Leaves alternate, petiolate. Flowers polygamous, in axillary or terminal spikes of cymes; rachis often cirrhose. Calyx superior, 5-fid; tube short, obconic. Petals 5, inserted below the margin of the disk, hooded. Stamens 5, enfolded by the petals. Discifiling the calyx-tube, 5-angled or stellate. Ovary sunk in the disc, 3-celled; style 3-cleft. Fruit inferior, coriaceous, crowned by the persistent limb of the calyx, 3-winged or boldly 3-angled, dehiscent-Distrib. About 50 species all tropical and mostly American.

Leaves entire; fruit triquetrous ... I. G. Andamanica.

Leaves crenate or serrate; fruit winged.

Young branches glabrous; disc-lobes ob-

long, truncate-emarginate at the apex ... 2. G. leptostachya

Young branches rufous-tomentose; disc-

lobes linear, acuminate ... 3. G. Javanica.

1. Gouania Andamanica, King n. sp. Young branches ferrugineous-pubescent, the older almost glabrous and striate. Leaves oblong-ovate, sub-acute, entire, narrowed to the base; both surfaces, but especially the lower, sparsely adpressed-pubescent; length 1.5 to 3.5 in., breadth 75 to 2 in., petiole 4 to 6 in. Spikes 3 to 9 in. long, sometimes cirrhiferous near the base, slender, rufous-pubescent. Flowers in distant 3-4-flowered cymes, sessile; bracteoles numerous, linear-lanceolate, rufous-pubescent. Disc glabrous, with 5 linear lobes. Styles united near the base, ovary densely tomentose. Fruit oblong, boldly

triquetrous but not winged, rusty-tomentose, 4 to 5 in. long and 25 to 35 in. in diam., the withered calyx very prominent at its apex.

Middle Andaman Island: common.

The nearest ally of this species is undoubtedly G. Brandisii, Hassk. from which however, this is easily distinguished by its more glabrous flowers, and oblong wingless fruit. This also (in its entire leaves) resembles G. microcarpa DC. and the S. American species G. discolor, Spruce.

2. GOUANIA LEPTOSTACHYA, DC. Prod. II, 4. Young branches glabrous. Leaves broadly ovate, acute or shortly and bluntly caudateacuminate, serrate or crenate in the upper three-fourths, the base rounded sub-truncate or slightly cordate; upper surface glaberulous, minutely sub-scaberulous when dry; the lower minutely areolate when dry, glabrous except the nerves which are sometimes puberulous; length 1.75 to 3 in. Racemes 6 to 12 in. long, slender, pubescent. Flowers in distant 3-4-flowered cymes, shortly pedicelled, almost glabrous. Disc glabrous, with 5 oblong truncate-emarginate lobes. Styles united for half their length. Fruit broader than long, emarginate at base and apex, glabrous; length '25 to '3 in., breadth '4 to '5 in. Roxb. Corom. Pl. I, 67, t. 98 (not Lamk.); Wall Cat. 4270: W. and A. Prod. 166: Dalz. and Gibs. Fl. Bomb. 50; Hook. fil. Fl. Br. Ind. I, 643; Kurz For. Flora Burma, I, 269; Miq. Fl. Ind. Bat. Vol. I, pt. 1, 650 (in part.) G. Nepulensis, Wall. in Roxb. Fl. Ind., ed. Carey, II, 417; Wall. Cat. 4272.

Perak and Andamans: - DISTRIB. Brit. India.

3. Gouania Javanica, Miq. Fl. Ind. Bat. I, pt. 1, p. 649. Young brauches and racemes rufous-tomentose. Leaves ovate, acute, crenate in the upper three-fourths, the base rounded or slightly cordate; upper surface shortly pubescent especially on the nerves; under surface areolate, sparsely pubescent, the nerves rufous-tomentose; main nerves 6 or 7 pairs, very little curved, ascending; length 1.5 to 2.5 in., breadth 1.1 to 2 in., petiole 5 in. Spikes 3 to 6 in. long, sometimes cirrhiferous near the base. Flowers in very short 2-4-flowered cymes, subsessile, each cyme with several sub-persistent ultimately reflexed lanceolate bracteoles. Calyx woolly, more or less rufescent. Disc glabrous, with 5 subulate marginal lobes. Styles united nearly to the apex. Fruit as in G. leptostachya, but one-third smaller. M. Javanica, Miq. Fl. Ind. Bat. Vol. I, Pt. 2, p. 649.

Malacca: Griffith; Sungei Ujong, Cantley 1855. Perak; King's Collector, Nos. 1009, 1046; Ridley, No. 3014; Wray, Nos. 3324, 4260. DISTRIB. Sumatra, Forbes, 1263, 2593, 2933a. Java.

This species has been often confounded with G. microcarpa DC., which it certainly resembles in some respects. I have examined a

large number of specimens of Indo-Malayan Gouania, and I have never seen one of true G. microcarpa from anywhere except Southern Peninsular British India or Ceylon. That species is characterised by sessile flowers covered externally by dense woolly white tomentum, and by glabrous usually entire or sub-entire leaves; while the flowers of G. Javanica, although sometimes woolly, are more or less rufescent, and the leaves are never quite glabrous or entire. The species of Gouania run, however, very close together, and I am not sure that it would not be better to reduce this and both G. microcarpa and leptostachya to G. tiliæfolia Lamk. which dates from 1791. obscure Malayan species G. denticulata (Smith in Ree's Cyclop. XVI); the West Indian G. pubescens (Lamk. Ill. 845 t. 1, ex. Poir. II, 819); G. dasyantha, (Mig. Analecta Bot. Ind. III, 6) and G. Retinaria, DC. (Retinaria scandens, Gaertn. Fruct. II, p. 187 t. 120 fig. 4) appear to me, from their descriptions, to be probably all reducible also to G. tiliæfolia, Lamk.

Order XXXIII. AMPELIDEAE.

Shrubs, usually climbing by tendrils, sometimes erect (Leea) or small trees; juice copious, watery. Stems angled, compressed or cylindric. Leaves alternate, usually petioled, simple or digitately or pedately 3-9-foliolate, rarely pinnate or decompound. Flowers in umbellate paniculate or spicate cymes, or spicate. Peduncles often transformed into simple or compound tendrils, or adhering to rocks or trees by viscid pads terminating the ultimate segments, or expanded into a broad floriferous membrane (Pterisanthes). Flowers regular, hermaphrodite, rarely unisexual. Calyx small, entire or 4-5-toothed or- lobed. Petals 4-5, distinct or cohering, valvate, usually caducous. Stamens 4-5, opposite the petals, inserted at the base of the disc or between its lobes; filaments short, subulate; anthers free or connate, 2-celled, introrse. Disc free, or connate with the petals stamens or ovary, annular or variously expanded. Ovary 2-6-celled; style short, slender, conical, or 0; stigma minute, or large flat and lobed; ovules 1-2 in each cell, ascending, anatropal, raphe ventral. Berry 1-6 celled, cells 1-2-seeded. Seed erect, often rugulose, albumen cartilaginous; embryo short, basal, cotyledons ovate. - DISTRIB. Species about 375, inhabiting the tropical and temperate regions of the whole world.

Scandent shrubs, usually bearing tendrils.

Flowers spicate or cymose. Ovary 3-celled,

cells 2-ovuled 1. Vitis.

Flowers sessile on the dilated membranous

peduncle 2. Pterisanthes.

Erect shrubs destitute of tendrils. Petals and stamens connate with the disc. Ovary 3-6-celled, cells 1-ovuled ... 3. Leea.

1. VITIS, Linn.

Sarmentose shrubs, usually climbing by means of leaf-opposed tendrils. Leaves simple or 3-9-foliolate, digitate or pedate, rarely pinnate or bipinnate. Flowers in umbellate paniculate racemose or spicate cymes, usually ebracteate, sometimes polygamous. Calyx short, entire, or 4-5-toothed. Petals 4-5, free or cohering at the apex. Stamens 4-5, inserted below the margins of the disk; anthers free. Ovary 2-very rarely 3-4-celled; style 0 or short; stigma minute and entire, or large and 4-lobed, ovules 2 in each cell. Berry ovoid or globose, 1-2-celled; cells 1-2-seeded.—DISTRIB. About 375 species growing mostly in the tropics and subtropics of Asia Africa and Polynesia, more rarely in America.

Note.—The genus Vitis as understood by Messrs. Bentham and Hooker in their Genera Plantarum and by Mr. Lawson in his account of the Indian species in Hooker's Flora of British India, comprises various plants which many botanical writers (and among others M. Planchon) distribute into genera which, as it appears to me, are founded on characters rather insufficient to warrant generic rank, although sufficient to form the bases of sections of one large broadly-marked genus. As the species treated of here are numerous and not very easy of identification, I have made two keys for them; the first drawn up under four sections which are considered genera by M. Planchon in his monograph of the Ampelidew in M. De Candolle's Suites du Prodromus; the second on the principle followed by Mr. Lawson in Sir Joseph Hooker's Flora of British India.

Sect. I. Ampelocissus. Flowers 4- to 5-merous; disc annular, adherent to the base of the ovary; style conical, striate, stigma minute; inflorescence thyrsoid corymbiform or cymose, the pedancle often tendril-bearing.

Inflorescence thyrsoid; leaves simple ... 1. V. barbata.

Inflorescence spicate or paniculate-spicate, the flowers in fascicles or solitary ... 2. V. macrostachya.

Inflorescence an elongated pendulous raceme of short spikes.

Leaves simple.

Sparsely strigose on both surfaces ... 3. V. gracilis.

Densely cinnamoneous-tomentose on the lower surface ... 4. V. cinnamonea.

Leaves digitate. Both surfaces of leaflets glabrous	ĸ	V moluetachua
Upper surfaces of leaflets glabrous except	υ.	v. porystaenya.
the midrib and main nerves.		
Lower surface with pale cobwebby		
	6.	V. polythyrsa.
Lower surface rusty-pubescent.		40
Main nerves of leaflets 5 to 8 pairs, flowers oblong; fruit obovoid-oblong,		
slightly angled	7.	V. thyrsiflora.
Main nerves of leaflets 8 to 10 pairs,		
flowers sub-globular; fruit oblong,		
boldly 3- to 4-angled	8.	V. compositifolia.
Upper surfaces of leaflets minutely rugu-		
lose-papillose, each papilla ending in a short hair	a	V. elegans.
short hair Sect. II. TETRASTIGMA. Flowers 4-merous,		0
herent to base of ovary; style very short; stigma la		
cymes axillary, corymbiform and not tendril-bearin		,
Leaves simple		V. Scortechinii.
Leaves digitately 3-foliolate.		
Leaflets glabrous on the upper surface, glaucous on the lower	. 1	I7
glaucous on the lower Leaflets glabrous on both surfaces, not	11.	V. peduncularis.
glaucous.		
Flowers only '05 in. long; seeds convex		
on one surface, 3-ridged on the other	12.	V. andamanica.
Flowers 1 in. long.		
Fruit dry; seeds 3-sided, excavated	1.0	77 717 *
on one side Fruit pulpy; seeds compressed, grooved	15.	V. Wrayi.
	14.	V. Lawsoni.
Leaves 3- to 5-foliolate, leaflets glabrous.		
Fruit pulpy; seeds compressed, concave on		
one surface, convex and rugulose on the other	15.	V. lanceolaria.
Fruit dry; seeds obovoid, slightly com-		
pressed, shortly beaked, not rugulose, vertically grooved on both surfaces	16	V Kanatlani
Sect. III. AMPELOPSIS. Flowers 5-merous;		
subulate, stigma entire; cymes leaf-opposed, usus		
tendril-bearing.		,
5 y		V. semicordata.
Leaves pinnate or bipinnate	18.	V. cantoniensis.

V. furcata.

V. discolor.

V. glaberrima.

V. juponica.

Sect. IV. Cissus. Flowers 4-merous, petals more or less calyptriform; disc 4-lobed; style subulate; stigma minute; inflorescence cymose or corymbiform, leaf-opposed, not tendril-bearing.

Leaves simple; flowers in umbellate cymes.

Stems thick, succulent, 4-winged ... 19. V. quadrangularis. Stems herbaceous or woody.

Leaves pubescent underneath, ovate-rotund, with rusty or rufescent pubescence ... 20. V. adnata. Leaves quite glabrous.

Flowers not more than 'l in. long.

Leaves coriaceous; their bases rounded or cuneate, not cordate; fruit obovoid, black ... 21.

Leaves membranous, usually coloured on the upper surface, ovate-lanceolate or lanceolate, their bases usually cordate rarely cuneate or rounded;

fruit red 22. Leaves membranous, broadly ovate,

Leaves membranous, broadly ovate, green, their bases deeply and widely

cordate; fruit globose or obovoid ... 23. V. repens.

Flowers more than 'l in. long; leaves rounded, sub-truncate or slightly sub-cordate at the base: fruit nearly 1 in. in diam. ... 24. V. cerasiformis.

Flowers 2 in. or more in length; leaves sagittate, sub-hastate or sub-truncate at the base; fruit 15 in. in diam. ... 25.

the base; fruit 15 in in diam. Leaves trifoliolate.

Leaflets more or less softly tomentose ... 26. V. mollissima.

Leaflets slightly pubescent on both surfaces 27.

Leaves 3- to 5-foliolate; leaflets glabrous or pubescent; seeds triangular with one side convex and very rugose ... 28.

Leaves pedately 7- to 9-foliolate, glabrous:

Leaves pedately 7- to 9-foliolate, glabrous; seeds globular with one side truncate ... 29. V. novemfolia.

1. Vitis barbata, Wall. in Roxb. Fl. Ind., ed. Carey, II, 478. Stems woody; the branches terete, sparsely covered with long dark subulate bristles and also some pale soft cobwebby hairs. Leaves ovate-reniform, with shortly acuminate apex and deeply cordate base, the edges unequally sinuate-dentate; upper surface when young with some scattered flexuose pale hairs especially on the nerves, when adult

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glabrous or nearly so; the lower surface woolly on the nerves and with scattered hairs between, often glabrescent when old; main nerves 6 or 7 pairs, spreading, the lower one or two pairs much curved and branching outwards; length 6 to 10 in., breadth 4.5 to 9 in.; petiole 2.5 to 6 in., with pubescence like the young branches, becoming glabrous with age. Inflorescence thyrsoid, sericeous-tomentose, 4 to 6 in. long, on an equally long peduncle bearing a long once or twice dichotomous tendril clothed with wool and bristles. Flowers 4-merous, on short pedicels. Calyx cupular, glabrous like the separating petals. Berry pedicelled, globular, '3 in. in diam., smooth, with scanty pulp and 3 or 4 compressed plano-convex shining seeds grooved on the plane surface and slightly rugulose on the convex. Wall. Cat. 5997, 5995 C. and D; Lawson in Hook. fil. Fl. Br. Ind. I, 651 in part; Kurz For. Flora Burma, I, 276. Ampelocissus barbata, Planch. in DC. Mon. Phan. V, 372. V. lanata Laws. (not of Roxb.) Fl. Br. Ind. I, 651, in part.

Andamans: King's Collectors. DISTRIB. Burma, Sylhet, Assam, and the base of the Eastern Himalaya.

Var. trilobata, leaves 3-lobed, pubescence rufous.

Perak: King's Collector, No. 1768. DISTRIB. Siam, Timor.

This species is distinguished by the mixture of soft pale hairs and dark subulate bristles with which the young stems petioles and tendrils are covered. The species is really an excellent one; but it has been misunderstood owing I believe mainly to a mistake of Wallich its author who issued, under the name V. barbata, specimens which bore the same number (5994) as his species V. rugosa, and which really belong to V. rugosa. As a rule, the pubescence of V. barbata is pale brown, and not rufescent. But in the Perak specimens the pubescence is pale ferrugineous, and the leaves moreover are slightly three-lobed. In other respects the Perak plant agrees with specimens from Burma, the Andamans and Sylhet. V. rugosa, to which this species is undoubtedly allied, appears however to be quite different. It has not the characteristic bristles of V. barbata, and its pubescence is always rufescent. V. rugosa has really little affinity with V. lanata, Roxb. to which it has been reduced by Lawson and others.

2. VITIS MACROSTACHYA, Miq. in Ann. Mus. Lugd. Bat. I, 94. All parts quite glabrous; branches slender, sub-compressed, angled, not winged. Leaves coriaceous, shining, broadly ovate or oblong, shortly and abruptly acuminate, the edges with a few distant short exserted spinous teeth, the base rounded, the reticulations minute and distinct on both surfaces when dry; main nerves 5 or 6 pairs, spreading; length 3 to 6 in., breadth 2 to 3 25 in., petioles 1 2 to 1 8 in. Spikes very narrow, much longer than the leaves, often in lax panicles, pendulous. Flowers

sessile or sub-sessile, solitary or in fascicles of 2 or 3, 4-merous; buds sub-globose, under 'l in. long. Calyx cup-shaped. Fruit oblong, succulent: seeds two, large, plano-convex, rugose. Laws. in Hook. fil. Fl. Br. Ind. I, 650. Cissus spicifera, Griff. Notulae IV, 963. Wall. Cat. 7468 indeterm. Nothocissus spicifera, Planch. in DC. Mon. Phan. V, 406.

Malacca, Griffith (No. 1300 K.D.); Derry No. 387; Maingay, No. 426 (K.D.), Harvey. Singapore: Wallich; Ridley, No. 5585. Penang, Porter. Perak: King's Collector, Nos. 2078, 3201, 6238, 10309: Wray, No. 2164; Scortechini, No. 482. DISTRIB. Sumatra.

Strictly speaking the name of this should perhaps be Vitis specifera. It is quite unlike any other Malayan Vitis and can be recognised at once.

3. Vitis gracilis, Wall. in Roxb. Fl. Ind., ed. Carey, II, 477. Stems slender, terete, not jointed, covered with sparse long rusty flexuose deciduous hair. Leaves broadly ovate-rotund, shortly acuminate; the base usually cordate, rarely sub-truncate, the edges with exserted bristle-teeth: upper surface sparsely strigose, the nerves pubescent: under surfaces very sparsely strigose, the nerves bristly-pubescent: main nerves 4 or 5 pairs, curving upwards, the lower pair branching outward; length 2.5 to 3.5 in., breadth 1.5 to 2.75 in.; petiole 1 to 1.5 in., rusty-sericeous. Inflorescence a slender pendulous raceme of short sub-horizontal spikes borne on a long slender tendril, the rachises rusty-sericeous. Flowers small, 4-merous, quite glabrous. Fruit elliptic, smooth, glabrous, red, somewhat 3-angled, about 5 in. long, with scanty pulp, and 4 large compressed seeds boldly ridged on the inner surface. Wall. Cat. No. 6007; Lawson in Hook. fil. Fl. Br. Ind. I, 653. Ampelocissus gracilis, Planch. in DC. Mon. Phan. V, 407.

Singapore: Wallich; Ridley, No. 1922. Selangor, Ridley, No. 328. Malacca; Derry. Perak: King's Collector, No. 10274; Wray, No. 1343.

4. Vitis cinnamonea, Wall in Roxb. Fl. Ind., ed. Carey, II, 483. Stems woody, channelled on one side, not jointed, yellowish or rustytomentose. Leaves coriaceous, ovate-reniform, sometimes 3-lobed, occasionally 3-partite, the apex or the lobes if present shortly acuminate, the edges sinuate-dentate with bristle points, or entire with exserted bristle-teeth; upper surface glabrous, dark olivaceous when dry, the lower uniformly covered with a thin closely adherent layer of dense cinnamoneous tomentum; main nerves 5 or 6 pairs, curving, spreading, prominent, the lower pair much branched outwards; length 5 to 7 in., breadth 4 to 5 in.; petioles 2.5 to 3 in., tomentose. Inflorescence a slender pendulous raceme of short sub-horizontal spikes borne on a long peduncle from the slender tendril, much longer than the leaves, rufous tomentose. Flowers sessile, glabrous, 4-merous, the buds sub-globular.

Calyx cupular. Berry sub-globular, 3-angled, 4 in. in diam., with very scanty pulp and a single obcordate seed with muricate margins. Wall. Cat. 5989 A; Lawson in Hook. fil. Fl. Br. Ind. I, 659. Ampelocissus cinnamonea, Planch. in DC. Mon. Phan. V, 403.

Penang: Wallich. Singapore: Ridley. Johore; King. Perak: Scortechini, Wray, King's Collector,—a common plant.

5. VITIS FOLYSTACHYA, Wall. Cat. No. 6028 in part. Stems glabrous, the older with thick corky lenticellate bark. Leaves 5- to 9-foliolate, often pedate; common petiole 3 in. or more in length: leaflets coriaceous, elliptic-oblong with cuneate bases, the apices cuspidate, the edges distantly serrate; both surfaces pale when dry, the upper shining, the lower dull and with a few scattered dark pustules: main lateral nerves 7 to 10 pairs, ascending; length 4 to 12 in., breadth 1.5 to 4 in., petiolules .5 to .75 in. Inflorescence as in V. thyrsiflora, but much longer, (1 to 2 feet) with only a few flexuose pale hairs. Fruit globose, succulent, .75 in. in diam. Lawson in Hook. fil. Fl. Br. Ind. I, 662. Ampelocissus polystachya, Planch. in DC. Mon. Phan. V, 411.

Malacca: Griffith, No. 1321; Maingay, No. 420.

A species of which I have seen no good specimen. It is closely allied to V. thyrsiflora from which the longer inflorescence and general absence of pubescence distinguish it. It is also allied to V. polythyrsa, Miq.

stems much warted and (like the petioles, petiolules, tendrils, inflorescence and under surfaces of the leaves) with pale, rarely rusty, rather scanty, cobwebby pubescence. Leaves 5- or often pedately 7-foliolate, the common petiole 3 to 5 in. long: leaflets coriaceous, elliptic or elliptic-oblong, usually with rounded (sometimes slightly oblique) bases, the middle one or two often with cuneate bases, the apices of all suddenly and shortly acuminate; the margins, except at the base, remotely and unequally crenate and with exserted teeth; upper surfaces glabrous except the pubescent midrib and nerves; length 3 to 7 in., breadth 1.5 to 3 in.; petiolnles 5 to 1 in., the outer the shorter. Inflorescence as in V. thyrsiflora, but with cobwebby, usually pale, pubescence. Flowers as in V. thyrsiflora. Fruit sub-globular, glabrous, 5 in. in diam., when ripe green with a red flush. Seeds 4, compressed, concave on one side, ridged on the other.

Perak: Wray, Scortechini, Ridley, No. 2999, King's Collector, Nos. 2169, 6403. Johore: Ridley, No. 4178. DISTRIB. Sumatra, Korthals.

This species comes very near to V. thyrsiflora, Miq., but differs notably in the character of its pubescence. There is in the Calcutta Herbarium an original specimen of V. polystachya, Miq., named by the

author himself, and there is no doubt that the Perak plant is quite the same. I believe also that the Bornean species V. Mottleyi described by Sir Joseph Hooker in 1862 (Linn. Trans. XXIII, 165) is also the same: and, if this is so, Sir Joseph's name being the earlier must stand. V. nitidu, Laws. in Hook. fil. Fl. Br. Ind. I, 662 should also, I believe, be reduced here.

7. VITIS THYRSIFLORA, Miq. in Ann. Mus. Lugd. Bat. I, 88 (excl. var. B.) Young stems, petioles, petiolules, tendrils and inflorescence densely rusty-tomentose. Leaves 5- to 7-foliolate, the common petiole 3 to 6 in. long; leaflets coriaceous, obovate-oblong or oblong, with cuneate bases, the outer two oblique, the apices of all shortly and abruptly caudate-acuminate; the edges in the upper half with hard cylindric exserted teeth, in the lower half entire: upper surface glabrous except the tomentose midrib and nerves; the lower rusty-pubescent; main nerves 5 to 8 pairs, ascending, prominent beneath and ending in the bristle teeth on the edge, transverse veins distinct; length 3.7 to 7 in., breadth 1.75 to 2.75 in.; petiolules 5 to 1 in., those of the middle leaflets longest. Inflorescence a slender pendulous raceme of short horizontal spikes borne on a peduncle shorter than itself and proceeding from a leaf-opposed tendril. Flowers sessile, oblong, 4-merous, glabrous. Calya truncate, petals expanding. Fruit obovoid-oblong, slightly angled, glabrous, with little pulp, about '75 in. long; seeds 4. Cissus thyrsiflora, Blume Bijd. 187; Hassk. Pl. Jav. Rar. 453; Mig. Fl. Ind. Bat. Vol. I, Pt. 2, 604. Ampelocissus thyrsiflora, Planch. in Mon. Phan. V, 409 (excl. syn. Vitis cinnamonea, Wall. and V. elegans, Kurz).

Perak: Scortechini, Nos. 121, 266; Wray, Nos. 1925, 1937, 2551; King's Collector, Nos. 509, 2033, 6366. Selangor: Ridley, No. 319.

8. Vitis compositional, Laws. in Hook. fil. Fl. Br. Ind. I, 659. Young stems and petioles covered with soft felted semi-deciduous rufous or rusty tomentum. Leaves quinate, the common petiole 6 to 15 in. long; leaflets oblanceolate or obovate-elliptic, the two outer often oblique, the apices of all abruptly and shortly cuspidate, the edges with remote exserted bristle-teeth in their upper half, entire in the lower; the bases of the inner leaflets cuneate, those of the outer two unequal, the outer side rounded; upper surface finely reticulate, glabrous, but with a few scattered hairs on the nerves, the midrib pubescent; lower surface uniformly and densely rufous-tomentose: main nerves 8 to 10 pairs, spreading, curved; length 6 to 10 in., breadth 2.75 to 4 in., petiolules 5 to 75 in. Inflorescence a slender pendulous raceme of short sub-horizontal spikes borne on a long peduncle and proceeding from a leaf-opposed tendril longer than the leaves, rufous-tomentose like the stems: flowers sub-globular, sessile, immersed in the tomentum of

the rachis but themselves perfectly glabrous, 4-merous: calyx truncate, petals expanding. Fruit oblong, 3-4-angled, glabrous, 5 to 75 in. long; when ripe red, with scanty pulp and 3 or 4 plano-convex seeds, the convex surface angular. V. cinnumonea, var. compositifolia, Wall. Cat. 5989 B. Anpelopsis compositifolia, Planch. in DC. Mon. Phan. V, 412.

Penaug: Wallich. Malacca: Maingay (Kew Distrib.), No. 418;

Perak: King's Collector, Nos. 826 and 5230; Scortechini.

9. VITIS ELEGANS, Kurz in Nat. Tijdsch. Ned. Ind. XXVIII, 166. Young stems, petioles, tendrils and inflorescence covered with dense reddish-brown tomentum. Leaves 3-foliolate, often pedately or digitately 5-foliolate, the common petiole 3 or 4 in. long; leaflets coriaceous, trapezoid-oblong or broadly oblong-lanceolate, much narrowed to the base, the outer two often very unequal-sided with broad sub-truncate or sub-cordate bases, the apices of all acute or sub-acute, and the edges with remote shallow crenations and exserted bristle-teeth; upper surface covered with minute conical rugae each ending in a short white hair, the midrib and nerves rusty-tomentose: lower surface uniformly covered with dense short rusty tomentum; main nerves 6 or 7 pairs, the outer lower nerve in the lower pair of leaflets branching outwards; length 3 to 6 in., breadth 1.75 to 3 in.; petiolules 5 in., subequal. Inflorescence as in V. compositifolia, but rather shorter and stouter; the flower buds oblong. Fruit unknown. Kurz Journ. As, Soc. Bengal, 1870 pt. 2, 74; Laws. in Hook. fil. Fl. Br. Ind. I, 659.

Singapore: Walker, Ridley, Hullett and others. Johore: Hullett and King. Malacca: Maingay (Kew Distrib.), No. 417. DISTRIB.—Bangka.

This resembles V. compositifolia Laws., but has more coriaceous leaves, rugulose-pubescent on the upper surface, and with shorter petioles. The inflorescence of this is also shorter and stouter, and the flower-buds are oblong rather than globular. The tomentum of this is shorter and less cobwebby and is of a darker colour. Planchon identifies this with Cissus thyrsiflora Bl. and it forms part of his Ampelocissus thyrsiflora, (DC. Mon. Phan. V, 409)—a reduction which he could hardly have proposed had he seen specimens of C. elegans. For although the two have many points of resemblance, their leaves are very different, those of C. elegans having their upper surfaces minutely rugulose-papillate, each papilla ending in a short white hair; while in C. thyrsiflora, Blume the upper surface is smooth and glabrous except the nerves.

10. VITIS SCORTECHINI, King n. sp. Branches woody, terete, glabrous, scaberulous, not jointed. Leaves coriaceous, oblong-ovate, sometimes oblique and rarely broad at the base and with two unequal lobes about the middle, the apex shortly acuminate, the base minutely cordate; the edges sub-entire, waved and slightly recurved, sometimes

obscurely serrate; upper surfaces glabrous, the lower softly and shortly cinereous-pubescent especially on the nerves; main nerves about 8 pairs, curved, spreading, prominent on the lower surface; length 5 to 7 in., breadth 2.5 to 3.5 in., petiole 75 to 1.25 in. Cymes compact, many-flowered, umbellate, about 1 in. in diam., on a peduncle 5 to 1 in. long, minutely rusty-tomentose. Flowers small, pedicellate, 4-merous; petals minutely tomentose externally. Fruit globular, smooth, 25 in. in diam., with scanty pulp and usually only one perfect seed, waxy-white when ripe.

Perak: Scortechini; King's Collector, Nos. 2897, 4644, 5942.

Var. pubescens, young stems pubescent, lower surface of leaves tomentose.

Perak: King's Collector, No. 5998.

11. VITIS PEDUNCULARIS, Wall. Cat. 6024. Stems stout, woody, with lenticellate brown bark, the youngest rusty-pubescent. Leaves 3-foliolate, the common petiole 3 to 6 in. long; leaflets petiolulate, coriaceous, broadly ovate or elliptic, the lateral pair oblique, all shortly cuspidate, the edges crenate-serrate; the base of the lateral pair unequal-sided, that of the lateral cuneate; upper surface glabrous, shining; the lower sub-glaucous, reticulate; main nerves 6 to 8 pairs, prominent on the lower surface, bearing a few scattered hairs; length 3.5 to 5.5 in., breadth 2 to 3 in.; petiolules of the lateral leaves '5 in. long, of the terminal about '75 in., all stout; tendrils simple. Cymes from the old wood, when in flower much shorter than the leaves, when in fruit almost as long, on long peduncles, umbellate, much branched in the upper part, covered with coarse short rusty pubescence. Flowers small, numerous, 4-merous. Calyx very short, flat. Petals pubescent, conjoined at first, their apices forming small divergent pointed processes, afterwards separating. Stigma 4-lobed. Fruit globular, somewhat depressed, 25 in. in diam., red when ripe, 2- to 3-seeded; seeds triangular-obovoid. Laws. in Hook. fil. Fl. Brit. Ind. I, 655. V. pubiflora, Miq. in Ann. Mus. Lugd. Bat. I, 74. Cissus pubiflora, Miq. Fl. Ind. Bat. Suppl. 516. Tetrastiqua? pedunculare, Planch. in DC. Mon. Phan. V, 438.

Penang: Wallich. Malacca: Maingay (Kew Distrib.), No. 423. Perak: Scortechini, No. 207; Wray, No. 366; King's Collector, Nos. 3521, 3970, 5087, 5364. DISTRIB.—Sumatra.

A species readily distinguished at a glance by its many-flowered much-branched cymes emerging from the old stems, and by its coriaceous leaves glaucous and boldly reticulate beneath. The petals are at first conjoined, except their apices which diverge: afterwards they separate and spread slightly from the base.

12. VITIS ANDAMANICA, King, n. spec. All parts, except the

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inflorescence, glabrous; young branches striate, lenticellate, black when dry. Leaves thinly coriaceous, oblong to elliptic, 3-foliolate or pedately 4- to 5-foliolate, shortly cuspidate, the edges with remote shallow teeth; main nerves 6 to 8 pairs, spreading, thin, slightly prominent on the upper surface; length 4-5 to 6 in., breadth 2 to 3-5 in., petiolules 4 to 85 in. Cymes axillary, many-flowered, much branched, spreading, about 1-5 in. in diam., puberulous, on peduncles shorter than themselves. Flowers small, buds oblong and about 05 in. long, 4-merous, the calyx truncate, the petals rusty-puberulous outside. Fruit globular-ovoid, glabrous, 3 in. in diam., with very scanty pulp and a single large subcompressed seed grooved on one face and 3-ridged on the other.

Andaman Islands: King's Collectors.

A species allied to *V. peduncularis* Wall. and of which very few specimens have as yet been obtained.

13. VITIS WRAYI, n. sp. King. Stems slender, terete, puberulous when young. Leaves 3-foliolate; common petiole 1 to 2 in. long; leaflets membranous, oblong-lanceolate, the middle one the largest; the laterals oblique, expanding towards the outer side, all shortly acuminate and coarsely and remotely serrate except at the cuneate base: main nerves 5 or 6 pairs, not prominent, spreading, curved; length 2.5 to 6 in.; breadth 1 to 2 in.; petiolules of the lateral leaflets 2 to 4 in., of the central 5 to 125 in. : tendrils slender, forked. Oymes slender, axillary, umbellate, spreading, 1 to 2 in. in diam., on slender pedicels shorter than themselves. Flowers 1 in. long. Calyx flat, with 4 obscure teeth, pubescent. Petals 4, oblong, pubescent. Fruit depressedglobular, glabrous, red when ripe, 45 in. in diam., with soft fleshy epicarp. Seeds 2 or 3, oblong, compressed, smooth, 3-sided, slightly convex on one side and with an oblong mark, flattened on the other two sides, one of them excavated and the concavity closed by a membrane, the other side plane.

Perak: Scortechini, No. 426. King's Collector, Nos. 2847, 4050, 5120, 6426: Wray, Nos. 2749, 3945.

This in some respects resembles V. novemfolia, but its leaves are only 3-foliolate, and its seeds are different.

14. VITIS LAWSONI, King. Young stems rather slender, tubercled as are usually the older stems. Leaves 3-foliolate: common petiole 1:25 to 4 in. long, glabrous: leaflets oblong, tapering to each end, acuminate, the margins (except at the entire bases) remotely erenate-serrate, often very obscurely so; both surfaces glabrous; main nerves 6 to 8 pairs, obscure; length 2:5 to 4 in., breadth 1 to 1:5 in., petiolules :25 to 5 in. Cymes small, 1 in. in diam., or less, dense, subsessile or on peduncles :25 to 1 in. long: tendrils free from the cymes, slender, often absent.

Flowers rather more than 'l in. long, calyx truncate or obscurely 4-toothed. Petals 4, white. Fruit sub-globular, smooth, pulpy; seeds 3 or 4, compressed, grooved in fruit. Vitis tuberculata, Lawson (not of Wall.) in Hook. fil. Fl. Br. Ind. I, 656. Cissus tuberculata, Bl. Bijdr. 189; Miq. Fl. Ind. Bat. Vol. I, pt. 2, 604. sub Tetrastigma lanceolarium, Planch. DC. Mon. Phan. V, 424.

Penang: Curtis, Nos. 1580. Perak: Scortechini, No. 269. Wray, No. 1926, 2017, 2247. King's Collector, Nos. 1852, 3047, 3081, 6287, 6134.

This is no doubt closely allied to Vitis lanceolaria, Wall to which Planchon reduces it. But the smaller and globular fruits, smaller leaves with fewer nerves, and the general absence of tendrils distinguish it well. This is the plant which Blume called Cissus tuberculata; but it is not the Vitis tuberculata of Wallich which becomes Vitis rumicisperma, Lawson. For this species Mr. Lawson keeps Blume's specific name, but he changes its generic name to Vitis—a course which I regret to be unable to follow, first because there is an earlier Cissus tuberculata than Blume's, (viz., that of Jacquin dating from the years 1797 to 1804 during which that author's Hortus Schoenbrunnensis was published, and which is therefore the plant to which any author who reduces Cissus to Vitis ought to give the name V. tuberculata); second, because Blume did not call his plant Vitis tuberculata but Cissus tuberculata.

15. VITIS LANCEOLARIA, Wall. Cat. 6013 (most of the letters). Whole plant except the inflorescence glabrous: stems sometimes boldly tuberculate. Leaves usually 3-foliolate, sometimes pedately 5-foliolate: common petiole 2 to 5 inches long; leaflets softly coriaceous, oblong or elliptic-oblong, tapering to each end, sometimes obovate-oblong, always shortly caudate-acuminate and the edges with remote shallow teeth; main nerves 6 to 10 pairs, spreading, slightly winged on the lower surface: length 4.5 to 6 in., breadth 1.75 to 2.75 in., petiolules '4 to '75 in. Cymes axillary, puberulous, spreading, about 1.5 in. across, on peduncles shorter than themselves. Tendrils rather short, forked. Flowers 4-merous, the stigma 4-lobed. Fruit globose-ovoid, as large as a cherry, white when ripe, pulpy, 1- or 2-seeded; the seeds compressed, concave on one surface, rugulose. W. and A. Prod. 128; Wight Ic. 177; Brand. For. Flora 101; Laws. in Hook. fil. Fl. Br. Ind. I, 660 (in part); Kurz For. Flora Burma, I, 272: Trimen Flora Ceylon, I. 296. Tetrastigma lanceolarium, Planch. in DC. Mon. Phan. V, 424. Vitis muricata, Wall. Cat. 6015; W. and A. Prod. 128; Wight Ic. 740. Cissus lanceolaria, Roxb. Fl. Ind. I, 412: DC. Prod. I, 632; Graham Cat. Bomb. Pl. 33; Thwaites Enum. Pl. Ceyl. 63. Cissus muricata, var. minor. Thwaites Enum. 63.

Penang: Curtis, No. 685, King. Singapore: Ridley, No. 5711. Perak: Scortcchini, No. 102; Wray, No. 1889. Andamans: Kurz, King's Collectors. Distrib. Java, Sumatra, British India.

Very good characters to distinguish this from its allies are that the main nerves of the leaves are in dried specimens winged on the lower surface, and that the fruit is white when ripe.

16. VITIS KUNSTLERI, King n. sp. Whole plant except the inflorescence glabrous. Stems slender, the younger not lenticellate and the older sparsely so. Leaves pedately 5-foliolate, common petiole 2 to 3 in. long, slender; leaflets oblong-lanceolate, shortly and abruptly acuminate, narrowed to the base, the outer two rounded at the base on the outer side; main nerves 7 to 9 pairs, prominent and slightly pale on the lower surface; midrib stout, pale and prominent beneath: length 2.5 to 4.5 in., breadth 1.1 in. to 1.75 in.; petiolules of the lateral leaflets ·25 in., of the others about 1 in. Cymes axillary, many-flowered, branching, condensed, about 1.5 in. across, on peduncles shorter than themselves, puberulous. Flowers 'l in. long, oblong in bud, 4-merous; the calvx flat, obscurely toothed, petals puberulous outside; stigma broad. 4-lobed. Fruit globular, glabrous, 35 in. in diam., without pulp: seeds 2, obovoid, slightly compressed, transversely rugulose, with a short beak and a vertical groove on each side, that in front being the deepest and having two narrow ridges on it, 25 in. long.

Perak: King's Collector, Nos. 2790, 8027: Scortechini. Pahang: Ridley, No. 2835.

A species allied to *V. andamanica*, King; also closely allied to *V. pycnantha*, Coll. and Hemsl., from which however it differs in its larger size and very different seeds; the seed of that species being longer (35 in. long), more compressed, less prominently grooved, and less rugulose.

17. VITIS SEMI-CORDATA, Wall. var. Scortechinii. Whole plant glabrous; stems dark-coloured when dry, lenticellate, without tendrils. Leaves 3-foliolate; common petiole 3.5 to 5 in. long: leaflets coriaceous, the middle obovate rarely ovate, the two outer elliptic, oblique; the apices of all shortly cuspidate; the edges coarsely crenate-serrate except in the lower third, the middle leaflet cuneate at the base, the other two more or less rounded outside and oblique inside at the base; both surfaces minutely reticulate, the lower paler: main nerves 6 or 7 pairs, rather prominent beneath, arching upwards; length 4 to 5 in., breadth 2.5 to 3.5 in.; petiolules of the lateral leaflets 1 to 2 in., that of the middle one twice as much. Cymes leaf-opposed, umbellately panicled, glabrous, 2 to 2.5 in. in diam. (much wider in fruit), on peduncles 1.5 to 2 in. long. Flowers diœcious, numerous; buds oblong, 15

in in length, pentamerous; the calyx flat, obscurely toothed; petals pale outside, glabrous, oblong. Ripe fruit ovoid, glabrous, smooth, black, '25 in long; seeds 2 or 3, if 2 plano-convex, if 3 triangular-convex.

Perak: Scortechini, 313, 317.—Distrib. Java. Forbes, Nos. 823, 983. Scortechini's specimens are in fruit only, and Forbes's are in flower and have no fruits. But the two sets are so absolutely identical in other respects, that I have ventured (quite contrary to my usual practice) to describe the flowers from one set and fruit from another set of specimens. The species of which this is a variety was first issued by Wallich as No. 6020 of his catalogue, and was described by him in his own and Carey's edition of Roxburgh's Flora Indica I, 481. (1824). In his Illustrations of Himalaya Botany (1839), Royle published what is really only a glabrous form of it under the name Gissus himalayana, which Sir D. Brandis in his Forest Flora of the North-West Provinces of India reproduces as Vitis Himalayana. Lawson in Hooker's Flora of British India accepts Brandis's name as that of the species, and uses Wallich's trivial name semi-cordata to designate, as a variety, the form which Wallich published as a species. This state of matters I therefore propose to amend as follows:-

Vitis semi cordata, Wall. Cat. 6020; in Roxb. Fl. Ind., ed. Carey and Wall. I, 481. V. Himalayana, Brandis, var. semi-cordata, Laws. in Hook. fil. Fl. Br. Ind. I, 656. Parthenocissus semi-cordata, Planch. in DC. Mon. Phan. V, 451.

Var. 1 Roylei. Vitis Himalayana, Brandis For. Flora 100; Laws. l. c. 655. Ampelopsis Himalayana, Royle III. Him. Bot. 149. A. neil-gheirensis, Wight Ic. 965. Cissus Himalayana, Walp. Rep. I, 441. All parts glabrous, leaves membranous; flowers less than '15 in. long.

Var. 2., Scortechinii. All parts glabrous; leaves obscurely serrate-crenate, sometimes almost entire, coriaceous; flowers 15 in. long.

18. VITIS CANTONIENSIS, Seem. Bot. Herald 370. Whole plant glabrous. Stem slender, cylindric. Leaves unequally pinnate, or the lower pair of pinnae ternately compound; common petiole from 5 to 1 in. long; leaflets small, membranous, glaucous beneath, lanceolate or ovate-lanceolate, acuminate, remotely serrate in the upper two-thirds, entire and cuneate in the lower third; main nerves 3 or 4 pairs, faint; length 75 to 15 in., rarely 2 in.; breadth 5 to 75 in., petiolules 1 to 2 in. Cymes umbellately-corymbose, dichotomous, about 75 in. across, their peduncles about 15 to 2 in. long. Flowers sub-globular, 1 in. long, 5-merous. Calyx cupular, obscurely toothed. Petals thick, oblong; disc fleshy, 5-lobed. Fruit obovoid, glabrous, 25 in. long, without pulp. Seeds 3 or 4, the back rounded, the face wedge-shaped. Laws. in Hook.

fil. Fl. Br. Ind. I, 663. Cissus cantoniensis, Hook. et Arn. Bot. of Beechey's Voyage 175; C. diversifolia, Walp. in Nov. Act. Acad. Leop. Car. Nat. Cur. XIX, Suppl. I.; Repert. Bot. Syst. V, 377; Pl. Meyeu. 314. Ampelopsis Cantoniensis, Planch. in DC. Mon. Phan. V, 460. Hedera hypoglauca, Hance in Walp. Ann. II, 724.

Malacca: Griffith. Perak: Scortechini, No. 234; King's Collector, No. 2285.—DISTRIB. China, Cochin-China.

19. VITIS QUADRANGULARIS, Wall. Cat. 5992. Stems fleshy, much contracted at the nodes, 4-winged, glabrous, leafless except when young. Leaves broadly cordate or reniform, sometimes 2-3-lobed, crenate-serrate, glabrous. Cymes on short peduncles, with spreading umbellate branches; flowers in umbels, glabrous, 4-merous. Berry globose, succulent, reddish-black when ripe, acrid. W. & A. Prodr. 125; Wight Ic. t. 51; Brand. For. Fl. 100; Laws. in Hook. fil. Fl. Br. Ind. I, 645. Cissus edulis, Dalz. in Hook. Lond. Journ. Bot. ix. 248; Dalz. & Gibs. Bomb. Fl. 40; Thwaites Enum. 62. Cissus quadrangularis, Linn. Mant. 39; Roxb. Fl. Ind. i. 407; DC. Prodr. i. 628; Grah. Cat. Bomb. Pl. 33; Dalz. & Gibs. Bomb. Fl. 39; Miq. Fl. Ind. Bat. Vol. I, pt. 2, 606; Planch. in DC. Mon. Phan. V, 509. Sælanthus quadragonous, Forsk. Descr. 33, t. 2.—Rheede Hort. Mal. vii. t. 41.

Malacca, Andaman Islands.—Distrib. British India, Ceylon, Java, East Africa.

20. VITIS ADNATA, Wall. Cat. 5998. Stems woody below; the young shoots more or less minutely rusty-tomentose, sub-terete when fresh but slightly furrowed. Leaves ovate-rotund, shortly and sharply acuminate, the edges bristle-serrate, the base deeply and widely cordate: upper surface sub-glabrous except the pubescent nerves; the lower rusty-pubescent especially on the midrib and nerves; main nerves 4 or 5 pairs, sub-ascending, prominent beneath, the lower pair branching outward; length 2.25 to 5 in., breadth 1.75 to 4 in., petiole .75 to 2.25 Cymes numerous, corymbose, in umbels on peduncles 1 to 2 in. long, about 5 in. across, few-flowered. Flowers 1 in. long, 4-merous; calux tomentose outside. Berry obovoid-pisiform, glabrous, black when ripe, succulent, generally one-seeded. W. and A. Prod. 126; Brandis Forest Flora N. W. Ind. 100; Laws. in Hook. fil. Fl. Ind. I, 649: Trimen Fl. Ceyl. 290. V. repens, Wall. (not of W. and A.) 5999B. Cissus adnata, Roxb. Hort. Beng. Fl. Ind. I, 405: DC. Prod. I, 627: Wight. Ic. t. 144: Thwaites Enum. Pl. Ceyl. 62; Dalz. and Gibs. Bomb. Fl. 39. Miq. Fl. Ind. Bat. Vol. I, Pt. 2, 606; Planch. in DC. Mon Phan. V, 494. C. cordata, Wall. Cat. 6001A. C. pyrrhodasys, Mig. Fl. Ind. Bat. Suppl. 517. ? C. aristata, Bl. Bijdr. 183.

Malacca: Ridley, No. 1165. Perak: Scortechini, Nos. 129, 1146;

King's Collector, Nos. 2934; Wray, Nos. 496, 1929.—DISTRIB. Java, Sumatra, British India, New Guinea, Cochin China, Madagascar.

21. VITIS FURCATA, Laws. in Hook. fil. Fl. Br. Ind. I, 646. Stems woody, terete, slightly swollen at the nodes but not jointed, glabrous as are all the other parts except the inflorescence. Leaves coriaceous, broadly ovate, rarely ovate-oblong, shortly and bluntly acuminate, the edges faintly and remotely serrate, the base broad and rounded or narrowed and sub-cuneate; both surfaces glabrous, the lower pair; main nerves 4 or 5 pairs, spreading, ascending, the lower pair branching outwards; length 2 to 4 in., breadth 1:1 to 2:5 in. Cymcs in spreading panicles shorter than the leaves, puberulous. Flowers 4-merous, pointed, the buds about 1 in. long. Calyx truncate, glabrous, Petals minutely pubescent externally. Fruit obovate, glabrous, black when ripe with scanty pulp and a single seed, about 35 or 4 in. long when dry.

Malacca: Maingay (Kew Distrib.), 424; Griffith, No. 1314; Derry, 382. Singapore: G. Thomson; Ridley, No. 4748. Perak: Wray, Nos. 1235, 1430; King's Collector, Nos. 2716, 6315, 6858.—DISTRIB. Sumatra: Forbes, No. 2534.

Var. pubescens, branches of the cyme rufous-pubescent; petals almost glabrous externally.

Province Wellesley: King's Collector, No. 1606. Perak: King's Collector, Nos. 794, 6429, 8402; Scortechini, No. 299.

22. VITIS DISCOLOR, Dalz. in Hook. Kew Journ. Bot. Vol. II, (1850), 39. Stems woody at the base only, glabrous, not glaucous, red when young, sub-angular. Leaves ovate-lanceolate to lanceolate, acuminate, the edges remotely bristle-serrate, the base usually more or less deeply cordate, sometimes rounded or caneate; both surfaces glabrous, the upper in most cases variegated with red and white, the lower purple: main nerves 5 to 7 pairs, the lower pair branching outwards; length 2.5 to 4 in., breadth .85 to 2 in., petiole .2 to 1.25 in. Cymes umbellate on slender pedancles, few-flowered, sparsely rufous-pubescent. Flowers 1 in. long, oblong in bud, 4-merous. Calyx truncate, pctals glabrous. Fruit globular, pyriform, glabrous, red when ripe and about 2 in. in diam., pulp scanty, seed solitary. Dalz. & Gibs. Bomb. Fl. 40; Mig. in Ann. Mus. Lugd. Bat. I, 86; Laws. in Hook. fil. Fl. Br. Ind. I, 647. V. inequalis, Wall. Cat. 6010; W. & A. Prodr. 125. ? V. diversifolia, Wall. Cat. 5996. ? V. costata, Wall. Cat. 6011. Cissus discolor, Blume Bijd. 181; Bot. Mag. 80, t. 4763; Miq. Fl. Ind. Bat. Vol. I, Pt. 2, 606; Hassk. Pl. Jav. Rar. 453; Planch. in DC. Mon. Phan. V, 496.

Perak: Scortechini. Andamaus: King's Collector.—Distrib. Java, Sumatra, Cochin-China, British India.

There is one form of this in which the leaves are very nearly sessile: and in many specimens the upper leaves have short petioles and rounded bases, while the lower have long petioles and cordate bases. As a rule the leaves of this plant are beautifully variegated on the upper surface, but individuals are not uncommon in which the leaves are green.

23. VITIS REPENS, W. and Arn. Prod. Fl. Pens. Ind. 124. Stems sub-terete when fresh, 4-angled when dry, glabrous, the young shoots glaucous. Leaves pale green, more or less broadly ovate, shortly acuminate, the margins wavy and with a few distant setose teeth, the base deeply and widely cordate; main nerves about 4 pairs, the lower branching outwards; length 2.5 to 3.5 in., breadth 1.75 to 3.25 in., petiole .75 to 1.5 in. Cymes few-flowered in shortly pedunculate compound umbels or thyrses, pubescent toward the upper part. Flowers pointed in bud, 1 in. long, 4-merous. Fruit globose or obovoid, 15 in. in diam. when dry, usually 1-seeded with little pulp, its pedicels recurved when ripe. Laws. in Hook. fil. Fl. Br. Ind. I, 646; Kurz For. Flora Burma I, 275. V. glauca, Wall. (not of Roxb.) Cat. 5990 (for the most part). Cissus repens, Lamk. Encyc. I, 31; DC. Prod. I, 628; Miq. Fl. Ind. Bat. Vol. I, pt. 2, 605; Planch. in DC, Mon. Phan. V, 504. P. C. cordata, Roxb. Fl. Ind. I, 407.

Perak: Wray, Nos. 1215, 1858, 2142. Andamans: King's Collector.—Distrib. British India, Java.

As was pointed out by Wallich, this differs from V. glaberrima, Wall. by its more deeply cordate leaves and smaller flowers. Closely, allied to this must be the species named Cissus pentagona by Roxburgh (Fl. Ind. I. 408); but Roxburgh's description is too brief to identity a species by in such a difficult genus as Vitis; and he has unfortunately left no figure of V. pentagona at Calcutta.

24. VITIS CERASIFORMIS, Teysm. and Binn. in Nat. Tijdsch. Ned. Ind. XXIX, 251, var. Wallichii, King. Branches with pale shining bark, obtusely 4-angled, not winged. Leaves oblong to ovate or ovate-oblong, rounded sub-truncate or slightly sub-cordate at the base, the apex shortly and bluntly acuminate; the edges remotely crenate-serrate, the teeth setose; main nerves 5 or 6 pairs, curved, spreading: length 2 to 4 in., breadth 1·2 to 2·4 in., petiole 5 to 75 in. Cymes few-flowered, lax, under 5 in. in diam., in pedicelled umbels from a common peduncle 5 to 1 in. long, sometimes in small thyrses. Flowers large for the genus, 4-merous; their buds 2 in. long, pointed. Calyx cup-shaped, truncate; petals coriaceous. Fruit when ripe as large as a cherry and similarly coloured. Vitis glaberrima, Wall. 5991 (in part); Laws. in Hook. fil. Fl. Br. Ind. 1, 646, (in part). Cissus cerasiformis, Planch. in DC. Mon. Phan. V, 621.

Singapore: Ridley, Nos. 1924, 6380, King. Perak: Scortechini. No. 262; Wray, No. 2858: King's Collector, Nos. 6212, 10470.—Distrib. Java, Forbes 480; Sumatra Forbes, Nos. 2583, 2861a.

The various specimens to which I have given the varietal name Wallichii vary somewhat as to the form of their leaves, some having them oblong with nearly truncate bases, while others have them breadly ovate with slightly cordate bases. In all, however, the leaves are broader than those in the typical form found in Java and originally described by Teysmann and Binnindyk, the bases of which are moreover cuneate. The large flowers and fruit, both of the typical form and of the variety Wallichii, however, at once distinguish this from the hastate or sagittate-leaved species which Wallich confused with it under one common name as V. glaberrima.

25. VITIS GLABERRIMA, Wall. in Roxb. Fl. Ind. ed. Carey, II, 476; Cat. 599, (in part). A weak climber, with herbaceous sub-compressed 4-angled slightly winged glaucous stems, the bark dark when dry. Leaves ovate-lanceolate, with broadly sagittate-cordate sub-hastate or sub-truncate bases, always attenuated upwards to the acute apex, the edges minutely and remotely bristle-serrate-crenulate; main nerves 4 or 5 pairs, faint, spreading, the lower branching outward; length 2 to 4 in., breadth 1.2 to 1.75 in.; petiole 6 to 8 or even 1.5 in. in the lower leaves. Cymes small, 3 to 6 in. in diam., umbellate on short pedicels from the apex of a common peduncle '4 to '8 in. long. Flowers 4-merous. Berry obovoid, 2-seeded, 15 in. in diam. when dry. W. and A. Prod. Fl. Pen. Ind. 125; Laws. in Hook. fil. Fl. Br. Ind. I, 646 (in part). Vitis hastata, Mig. in Ann. Mus. Lugd. Bat. I, 85. Vitis sagittifolia, Laws. in Hook. fil. Fl. Br. Ind. I, 645. Cissus glaberrima, Planch. in DC. Mon. Phan. V, 498. Cissus hastata, Mig. Fl. Ind. Bat. Suppl. 517. Vitis diffusa, Laws. in Hook. fil. Fl. Br. Ind. I, 646.

Singapore: Anderson, No. 78; Hullett, No. 230, King. Malacca; King. Perak: Scortechini, Wray. Penang; Wallich, King. Kedah; Curtis No. 2606. Province Wellesley; King. Andamans and Nicobars; King's Collectors. Distrib. Sumatra, Bangka.

Under the name V. glaberrima and the number 5991, Wallich distributed two species of Vitis gathered partly in Penang and partly in Singapore. These two gatherings are not, as is usual with Wallich in similar cases, distinguished by letters. On two of the four sheets of No. 5991 which are now present in the Calcutta Herbarium, "Penang" is given as the locality; and these agree with the description of the species Vitis glaberrima from Penang which was published by Wallich in Carey's edition of Roxburgh's Flora Indica. This Penang plant agrees absolutely with type specimens of Vitis hastata, Miq. and V. sagittifolia,

Laws. On the third sheet of No. 5991 no locality is noted. On this sheet is glued down a specimen of a different species which I have identified as a variety of the one named V. cerasijormis by Teysmann and Binnindyk many years after the issue of Wallich's plants. The fourth sheet of No. 5991 at Calcutta is occupied by stems of the latter and a collection of leaves of both the former and latter. The V. glaberrima of Wall. Cat. is thus a mixed species; and as such the name would have had to be dropped had not Wallich published a description of his Penang No. 5991 under that name in Carey's edition of Roxburgh's Flora.

26. VITIS MOLLISSIMA, Wall. in Roxb. Fl. Ind. ed. Carey, II, 482. Stems rather slender, woody, when young softly pubescent, when adult glabrous and shining. Leaves 3-foliolate; the common petiole 2 to 2.5 in. long, tomentose; leaflets petiolulate, the lateral pair obliquely elliptic, the terminal obovate-elliptic, all with shortly acuminate apices, and coarsely but sparsely serrate or sub-entire edges; the lateral pair with rounded or sub-cordate the terminal one with a cuneate base; upper surface sparsely adpressed-pubescent, the midrib and nerves rusty-tomentose; the lower uniformly and softly-tomentose: main nerves 5 or 6 pairs, ascending, the lower branching outwards; length 3.25 to 5 in., breadth 1.75 to 2.75 in., petiolules of the lateral leaflets 25 to 4 in., those of the terminal twice as long; tendrils slender. Cymes half as long as the leaves; their peduncles 1.5 to 3 in. long, umbellate, spreading, manybranched, many-flowered, 1.5 to 2.5 in. across, minutely tomentose. Flowers 1 in. long, oblong, 4-merous; calyx short, truncate; petals puberulous outside. Fruit oblong, '75 to 1 in. long, when ripe dirty white, with scanty pulp and two large plano-convex seeds. Wall. Cat. 6012; Laws, in Hook, fil. Fl. Br. Ind. I, 656. Cissus mollissima, Planch. in DC. Mon. Phan. V, 575.

Penang; Wallich, Curtis No. 1435. Malacca; Griffith, No. 1332, Maingay (Kew Distrib.), No. 422. Pahang: Ridley, No. 1134. Perak: King's Collector, Nos. 2744, 4223, 5848 and 10485.

27. VITIS TRIFOLIA, Linn. Sp. Pl. 203. Stems compressed, herbaceous, or woody near the base only, when young shortly and densely pubescent, becoming sub-glabrous with age. Leaves 3-foliolate, common petiole 1.25 to 2.25 in. long; leaflets shortly petiolulate, ovate, obovate or sub-rhomboid, shortly cuspidate, coarsely serrate or dentate, the bases rounded, more or less pubescent on both surfaces; main nerves 5 or 6 pairs, slightly curved and ascending; length 1.5 to 2.5 in., breadth 8 to 1.25 in., petiolules of the lateral leaflets 1 to 2.5, of the terminal twice as much; tendrils short, slender, usually branched. Cymes 2 or 3 in. in diam., pubescent, on long peduncles rather exceeding the leaves, about 3-branched, the umbellules cymose. Flowers 4-merous,

white, about 'l in. long; the calyx truncate, short; the petals pubescent ontside. Berry turbinate, fleshy, 2- to 4-seeded, seeds triangular. Vitis carnos:, Wall. Cat. 6018; W. and A. Prodr. 127; Wight Ic. 171; Brand. For. Fl. 101; Laws. in Hook. fil. Fl. Br. Ind. I, 654; Trimen Fl. Ceyl, I, 294; Planch. in DC. Mon. Phan. V, 570. V. crenata, Wall. Cat. 6021. Cissus trifoliata, Linn. Sp. Pl. 203. C. auriculata, Roxb. Wall. Cat. 6031b. C. carnosa, Roxb. Fl. Ind. I, 409; DC. Prodr. I, 630; Grah. Cat. Bomb. Pl. 33; Dalz. and Gibs. Bomb. Fl. 40. C. crenata, Vahl, DC. Prodr. I, 631. C. cinerea, Lamk.; DC. Prodr. I, 631. C. obtusifolia, Lamk. Dict. I, 31?—Rheede Hort. Mal. vii. t. 9.

Malacca; Harvey. Singapore; Hullett, No. 95. Perak: Scortechini. Andamans; King's Collector. Nicobars; Kurz.—Distrib. British India, Java.

28. VITIS JAPONICA, Thunbg. Fl. Japan, 104. Glabrous or pubescent. Stems slender. Leaves 3-foliolate or pedately 5-foliolate; common petiole 1.5 to 2.5 in. long; leaflets membranous, ovate to oblanceolate, the outer oblique, all shortly acuminate and coarsely and unequally serrate-dentate in the upper part, entire towards the narrowed base: main nerves slightly prominent on the under surface, 7 to 9 pairs, straight, ascending; length 1.5 to 4 in., breadth .85 to 1.75 in.; petiolules 2 to 5 in., that of the middle leaflet sometimes even 1 in.: tendrils slender, forked. Cymes spreading, branched, open, 2 to 3 in. across, always more or less puberulous. Flowers ovoid-globose, '15 in. long, 4-merous. Calyx cupular, petals broad. Fruit sub-globular, somewhat depressed, glabrous, 25 to 3 in. in diam. Seeds 3 or 4, triangular, one side convex and very rugose, the other two flat and pitted, one of the pits closed by a membrane. Cissus japonica, Willd. Sp. Pl. I, 659: DC. Prod. I, 632; Planch. in DC. Mon. Phan. V, 561 (in part). Vitis mollis, Wall. Cat., No. 6025; Laws. in Hook. fil. Fl. Br. Ind. I, 660.

Singapore, Malacca, Perak, Penang, Nicobar, Andaman Islands: common.—Distrib. Java, New Caledonia, Australia, Japan, China.

The larger forms of this resemble V. novemfolia, Wall., but have not so many leaflets. The two species are however closely allied, as also are the less pubescent forms of V. pedata, Vahl. The seeds of this are remarkable in shape, approaching these of V. novemfolia but with two plane sides instead of one. This is also even more closely allied to V. tenuifolia W. and A., from which it is indeed very often difficult to distinguish it, in the Herbarium at least.

29. VITIS NOVEMFOLIA, Wall. Cat. 6030. Whole plant except the inflorescence glabrous. Stems slender, striate. Leaves membranous, usually pedately 7- to 9-foliolate; common petiole 2.5 to 3 in. long; leaflets oblong-lanceolate, shortly acuminate, entire or with a few exserted

bristle teeth near the apex, the base narrowed; lower surface minutely reticulate; length 2 to 3.5 in. breadth 85 to 1.35 in.; petiolules of the middle leaflets sometimes as much as 3 in. long, those of the lateral leaflets from 28 to 1.25 in.; tendrils long, slender, forked. Cymes axillary, puberulous, much-branched, spreading, 3 to 6 in. across, on peduncles as long as the leaves. Flowers broadly ovoid in bud, 15 in. long, 4-merous; the calyx cupular, truncate; the petals broad, minutely puberulous externally; disc large, cupular, thin. Fruit ovoid or subglobular, with two deep grooves, glabrous, 3 in. in diam., without pulp; seeds 2, globular, truncate and with a deep pit on one side, the opening occluded by a membranc. Laws. in Hook. fil. Fl. Br. Ind. I, 662. Cissus novemfolia, Planch. in DC. Mon. Phan. V, 559.

Perak: Scortechini, No. 1728; King's Collector, Nos. 1245, 2736. Andamans: King's Collectors.

The plant above described agrees with Wallich's imperfect specimens from Singapore. It is readily recognised by the great inequality of the petiolules of its leaflets. The middle leaflet is usually quite free from the others and has a much longer petiolule than they have.

Species imperfectly known.

VITIS CORIACEA, DC. Prod. I, 632. A species from Timor too briefly described by De Candolle for accurate identification. There are in the Calcutta Herbarium specimens from the Andamans (King's Collectors, No. 3000) and from Sumatra (Forbes, No. 1344), both of which agree with a specimen in the Kew Herbarium named V. coriacea, DC. The Sumatra specimens have pedately 5- to 7-foliolate leaves; the leaflets are coriaceous, glabrous, obliquely oblong or obovate-oblong, bluntly cuspidate, remotely serrate-crenate, with rounded or tapering bases; they are 2.5 to 4. in. long and 1.35 to 1.75 in. broad; the cymes are widely branching, nearly 3 in. across when in fruit, and on short warted peduncles 1 in. long: the fruit is ovoid-globose, 2 in. in diam., with a thick pericarp and no pulp. The seeds are large, solitary, ovoid, smooth, with shallow transverse markings and a very shallow vertical groove down each face. In the Andaman specimens the leaflets are larger and less coriaceous, the cymes are larger (6 in. wide), and the fruit and seeds are slightly longer. But the appearance and structure of the seeds is exactly the same in both; and I believe both may be V. coriacea, DC.

Leaves simple, flowers 4-merous. Flowers in umbellate cymes, not borne on tendrils. Stems thick, succulent, 4-winged ... 19. V. quadrangularis. Stems herbaceous or woody. Leaves pubescent underneath. Leaves oblong-ovate, with cinereous pubescence 10. V. Scortechinii. ... Leaves ovate-rotund, with rusty or rufescent pubescence 20. V. adnata. Leaves everywhere glabrous. Flowers not more than '1 in. long. Leaves coriaceous, their bases rounded or cuneate, not cordate; fruit obovoid, black ... 21. V. furcata. membranous, coloured (usually) on the upper surface, ovate-lanceolate or lanceolate, their bases usually cordate, rarely cuneate ... 22. V. discolor. or rounded; fruit red... Leaves membranous, broadly ovate, green, their bases deeply and widely cordate; fruit globose or obovoid... 23. V. repens. Flowers more than 'l in, long; leaves rounded, sub-truncate or slightly subcordate at the base; fruit nearly 1 in. in diam. 24. V. cerasiformis. Flowers 2 in. or more in length; leaves sagittate, sub-hastate or sub-truncate at the base; fruit '15 in. in diam. ... 25. V. glaberrima. Flowers in much elongated simple, or sometimes branching, spikes 26. V. macrostachya. Flowers in tendril-bearing thyrses ... 1. V. barbata. Flowers in elongated racemes of sub-horizontal spikes proceeding from tendrils. Leaves sparsely strigose and slightly pubescent, not rufescent ... 3. V. gracilis. The under surface of leaves and the young branches and tendrils covered with dense adherent cinnamoneous tomentum ... 1. V. cinnamonea,

Leaves compound, digitate.
Inflorescence of corymbose or umbellate
leaf-opposed or axillary cymes.
Leaves trifoliolate.
Flowers usually 5-merous, tendrils absent 17. V. semicordata.
Flowers 4-merous, tendrils usually pre-
sent.
Leaflets more or less softly tomentose 26. V. mollissima.
Leaflets slightly pubescent on both
surfaces 27. V. trifolia.
Leaflets glabrous on the upper, glau-
cous on the lower, surface 11. V. peduncularis
Leaflets glabrous on both surfaces, not
glaucous.
Flowers only '05 in. long; seeds
convex on one surface, 3-ridged on
the other 12. V. andamanica.
Flowers 1 in. long.
Fruit dry, seeds 3-sided, excavated
on one side 13. V. Wrayi.
Fruit pulpy; seeds compressed,
grooved in front 14. V. Lawsoni.
Leaves 3- to 5-foliolate; flowers 4-merous.
Leaflets quite glabrous.
Fruit pulpy; seeds compressed, con-
eave on one surface, convex and
rugulose on the other 15. V. lanceolaria.
Fruit dry; seeds obovoid, slightly
compressed, shortly beaked, not
ragalese, vertically grooved on both
surfaces 16. V. Kunstleri.
Leaflets glabrous or pubescent; seeds
triangular with one side convex and
very rugose, the other two sides flat
and one of them with a membrane-
closed pit 28. V. japonica.
Leaves pedately 7- to 9-foliolate; seeds
globular with one side plane and with a
membrane-closed pit 29. V. novemfolia.
Inflorescence a slender pendulous much
elongate raceme of short horizontal spikes
borne on a leaf-opposed tendril.
Both surfaces of leaflets glabrous 5. V. nolustachua

7. V. thyrsiflora.

Upper surfaces of leaflets glabrous except the midrib and main nerves.

Lower surface with pale cobwebby pubes-6. V. polythyrsa.

Lower surface rusty pubescent.

Main nerves of leaflets 5 to 8 pairs; flowers oblong, fruit obovoid-oblong, slightly angled

Main nerves 8 to 10 pairs; flowers sub-globular, fruit oblong boldly 3- to

4-angled 8. V. compositifolia.

Upper surfaces of leaflets minutely rugulosepapillose, each papilla ending in short hair ... 9. V. elegans.

Leaves pinnate or bi-pinnate; flowers 5-merous... 18. V. cantoniensis,

PTERISANTHES, Blume.

Scandent tendril-bearing slender shrubs. Leaves simple or trifoliolate, digitate or pedate. Flowers small, 4-5-merous, inserted on a flattened membranous rachis, a few pedicellate on the margin, the others sessile and sunk in the tissue of the rachis. Calyx cupular or obscurely toothed. Petals deciduous. Disc cushion-like, 4- or 5-angled. Style short; stigma capitate. Perry obovoid or globose, 1 to 4-seeded.—Dis-TRIB. 4 species, all Malayan.

Leaves simple ... 1. P. coriacea.

Leaves 3-foliolate.

Adult leaves glabrous 2. P. cissoides. Adult leaves rusty-tomentose beneath ... 3. P. heterantha.

Leaves 5-foliolate 4. P. pedata.

1. Pterisanthes coriacea, Korth. ex. Miq. Ann. Mus. Lugd. Bat. I, 95. Stems slender, glabrous. Leaves broadly ovate, acute or acuminate, the edges distantly and sometimes obscurely glandular-dentate, slightly revolute when dry, the base minutely cordate; main nerves about 4 or 5 pairs, rather faint, spreading, the reticulations distinct, both surfaces glabrous and shining; length 3 to 5 in., breadth 1.75 to 3.35 in., petiole .75 to 1.25 in. Inflorescence on a slender (often tendrilbearing) peduncle, membranous, narrowly oblong, 4 or 5 in. long and about I in. broad; the edges wavy, reddish when fresh. Male flowers 4-merous, few, distant, '15 in. in diam., their pedicels '5 in. long. Female flowers numerous. Fruit sessile, globular, glabrous, 3 in. in diam. P. polita, Lawson in Hook. fil. Fl. Br. Ind. I, 663. Vitis polita, Mig. Ann. Mus. Lugd. Bat. I, 85.

In all the provinces except the Andamaus and Nicobars: common.

The first author to put this plant into the genus *Pterisanthes* was Korthals who (*fide* Miquel Ann. Mus. Lugd. Bat. I, 85), thus named it in the Herbarium (at Leiden?). Miquel regarded *Pterisanthes* as only a section of *Vitis*. He had therefore to find a name for this plant in that genus; and, finding the name *V. coriacea* pre-occupied by a species of *Cissus* (DC. Prod. I, 632), he called this *V. polita*, Miq.

Var. araneosa; Leaves often ovate-oblong, always more or less rufescent cobwebby beneath. Vitis araneosa, Miq. Ann. Mus. Lugd. Bat. I, 94. Cissus araneosa, Miq. Fl. Ind. Bat. Suppl. 517.

Perak: King's Collector, No. 646; Wray, Nos. 2556, 3015, 4621.

Mr. Wray in his field note on this says "leaves with a shining black line round the edge on the outer margin of which is a line of warm brown hair, midrib beneath reddish."

2. Pterisanthes cissoides, Blume Bijdr. 193. Stems glabrous. striate. Leaves 3-foliolate; the middle leaflet narrowly wedge-shaped, the two lateral more or less oblong, rounded on the outer side, straight on the inner, all with a few obscure distant teeth in the upper half or third, entire in the lower; both surfaces with deciduous arachnoid hairs, glabrous when adult; main nerves about 4 pairs, spreading; length 3 to 6 in., breadth 1.25 to 3in., petioles 1.5 to 3.5 in.; petiolules of the middle leaflets twice as long as those of the lateral. Flattened floriferous rachis of the inflorescence variously lobed, from 2 to 6 in. long and less than half as broad, borne on tendril-bearing branches longer than the leaves. Male flowers on slender pedicels '75 in. long, 4-merous. Female flowers numerous. Fruit globose, 35 in. in diam., with coriaceous epicarp and about 4 seeds. Miquel in Linnaea, XVIII, 385, t. VIII: Fl. Ind. Bat. I, pt. 2, 608; Laws. in Hook. fil. Fl. Br. Ind. I, 664. Vitis Pterisanthes, Mig. Ann. Mus. Lugd. Bat. I, 94. Embamma cordigera. Griff. Notulae IV, 694: Ic. Pl. Asiat. t. 646. Cissus involucrata, Spreng. Syst. IV, pt. 2, 44. Pterisanthes involucrata, G. Don. Syst. I, 694.

Malacca: Griffith (Kew Dist.), No. 1299; Maingay. Perak: Scortcchini; King's Collector, Nos. 727, 7914.—DISTRIB. Java.

3. Pterisanthes heterantha, Laws. in Hook. fil. Fl. Br. Ind. I, 664. Stems cobwebby when young, ultimately glabrous. Leaves 3-foliolate, rarely 5-foliolate, the middle leaflet more or less wedge-shaped and usually broader than the obliquely ovate-oblong laterals, (sometimes all three more or less oblanceolate), acute or shortly acuminate, remotely glandular-dentate in the upper part; upper surface glabrous except the pubescent nerves; the lower rusty-tomentose; main nerves of leaflets about 5 pairs, spreading, rather straight; length 2 to 4.5 in., breadth '8 to 2.5 in., petioles '8 to 1.5 in. Flattened rachis narrowly-oblong, sinuate, acuminate, 3 to 5 in. long and '3 to '75 in. broad, borne

on a tendril-bearing peduncle shorter than the leaves. Flowers 4-6-merous (fide Lawson). Fruit globular, 25 in in diam. Embamma heterantha, Griff. Notulae IV, 694. Vitis rufula, Miq. Ann. Mus. Lugd. Bat. I. 94. Cissus involucrata, Miq. (not of Spreng.) Fl. Ind. Bat. Suppl. 517.

Malacca: Griffith, Maingay. Perak: Scortechini; King's Collector, Nos. 678, 1084.

There are in Herb. Calcutta two specimens from Perak (Wray, No. 1178 and Scortechini without number) which apparently belong to this species, but which have pedate leaves with 5 leaflets.

4. Pterisanthes pedata, Laws. in Hook. fil. Fl. Br. Ind. I, 664. Stems sparsely pubescent when young, glabrous when old. Leaves pedate, 5-foliolate, oblanceolate; the lower two smaller, the apex with a short stout bristle, the edges remotely glandular-dentate in the upper part; both surfaces, but especially the lower, sparsely arachnoid-hairy, the edge on the lower surface densely so: main nerves of leaflets about 4 pairs, spreading; length 2 to 3 in., breadth 6 to 1.25 in.; petiole about 1 in.; petiolules about 35 in.; those of the lower leaflets rather shorter. Inflorescence glabrous, borne on a short tendril-bearing peduncle. Flowers 4-merous. Fruit unknown.

Malacca: Griffith, Maingay (Kew Distrib.), No. 432.

This is known only from Griffith's and Maingay's very scanty specimens. It may be only a pedate form of *P. heterantha*.

3. LEEA, Linn.

Small trees, shrubs or herbs. Branches striate or sulcate, often herbaceous. Leaves alternate, usually very large, simple, or 1-2-3-pinnate; petiole often dilated at the base, stipules sheathing. Peduncles opposite the leaves or sub-terminal. Tendrils 0. Inflorescence corymbosely-cymose. Flowers red yellow or green. Calyx 5-toothed. Petals 5, connate at the base and adhering to the staminal tube, revolute. Stamens united at the base into a 5-lobed tube, the filaments inserted between the lobes of the tube, inflexed; anthers exserted. Ovary inserted on the disc, 3- to 8-celled; style short, stigma swollen; ovules 1 or 2 in each cell, erect. Fruit 3- to 8-celled, berry-like, usually succulent, depressed-globular and lobed, pulp often scanty. Pyrenes wedge-shaped, seeds compressed.—Distrib. Species about 50, mostly tropical Asiatic and African, a few Australian.

Leaves simple, or with 3 to 5 large pinnules.

Leaves pubescent beneath, cymes on long peduncles 1. L. latifolia.

Leaves quite glabrous on both surfaces;

cymes on short peduncles.

A tree; leaflets 5 2. L. grandifolia.

A shrub 12 to 18 in. high; leaves simple	
or at most 3-partite, teeth of staminal tube	
	L. simplicifolia.
A shrub 12 to 18 in. high: leaves never	
simple, leaflets 3 to 5, teeth of staminal	
tube faintly emarginate but not bifid;	
flowers few 4.	L. paucistora.
Leaves pinnate or bi- or tri-pinnate, leaflets nu-	
merous.	
Leaflets glabrous on both surfaces.	
Buds oblong, cymes 9 to 24 in. across:	
	L. gigantea.
Buds globular.	
Stem and branches thorny 6.	L. angulata.
Unarmed.	
Cymes not more than 8 or 9 in.	
across, spreading, lax, on long pe-	
·	L. Sambucina.
Cymes only 1.25 to 2.25 in. across,	
compact, flowers red 8.	L. acuminata.
Buds obovoid and on long pedicels;	
cymes large, lax, divaricating; flowers	
0	L. Curtisii.
Leaflets glabrous on both surfaces, main	
nerves winged and crisped and with lines	
of minute black hairs along them when	
	L. rubra.
Leaflets hairy underneath but without	
glands.	
Cymcs on long peduncles, lobes of	*
staminal tube not emarginate 11.	L. robusta.
Cymes on short peduncles, lobes of	<u> </u>
staminal tube emarginate 12.	L. javanica.
Leaflets hairy underneath and with numer-	7
ous flat discoid glands 13.	
1. Leea Latifolia. Wall. Cat. 6821. A shrub	voung branche

1. Leea latifolia, Wall. Cat. 6821. A shrub, young branches rusty furfuraceous-puberulous. Leaves simply pinnate, leaflets 3 to 5, oblong to sub-orbicular, sub-acute or obtuse, remotely serrate, the base sub-cordate; upper surface glabrous; the lower paler with some scattered pale hairs on the midrib and 10 to 12 pairs of spreading nerves, the reticulations transverse and very distinct; length 9 to 12 in., breadth 6 to 11 in. Cymes on long peduncles, umbellate, with branches

3 to 5 in. long, shortly pubescent. Lobes of the staminal tube notched. Kurz For. Flora Burma, I, 278: in Journ. As. Soc. Beng., Vol. 44, pt. II, p. 178; Clarke in Trimen's Journ. Bot. for 1881, p. 138. L. macrophylla, Laws. (not of Hornem.) in Hook. fil. Fl. Br. Ind. I, 664. L. cinerea and L. coriacea, Laws. in Hook. fil. Fl. Br. Ind. I, 665.

Andaman Islands: King's Collectors.—DISTRIB. Burma.

2. Leea grandifolia, Kurz in Trimen's Journ. Bot. 1875, p. 325. A small tree 10 to 20 feet high: young branches lenticellate, glabrous, sparsely vertucose. Leaves glabrous, simply pinnate; leaflets 5, broadly ovate to oblong-ovate, shortly acuminate, the edges with large shallow crenations or sub-entire; the base broad, rounded: main nerves 8 to 10 pairs, spreading, much curved at the tips; both surfaces glabrous, the reticulations not prominent: length 9 to 12 in., breadth 4 to 5 in.; petiolules of the terminal leaflet 2 in., of the laterals 5 to 75 in. Cymes about 4 in. across, on peduncles only about 1 in. long, trichotomously umbellate, the branches about 1 in. long, almost glabrous. Flowers greenish white; lobes of staminal tube emarginate. Fruit subglobular, depressed, lead-coloured when ripe.

Nicobar Islands: Jelinek; Katchal, Kurz: Bati Malv, Prain.

This differs from *L. latifolia* in having verruculose branches, perfectly glabrous obscurely reticulate leaves, and small very shortly pedunculate cymes.

3. LEEA SIMPLICIFOLIA, Zoll. in Natur en Geneesk. Arch. II, 577. An unbranched shrub 12 to 18 in. high; stem glabrous, sparsely lenticellate. Leaves simple or ternate: the simple broadly elliptic, somewhat obovate, shortly and abruptly acuminate, the edges sinuate-serrate or sub-entire, the base narrowed and sometimes minutely cordate; both surfaces glabrous, the lower bright brown when dry and with the reticulations very distinct; main nerves 9 to 12 pairs, spreading, rather straight; length of the simple leaves 4.5 to 9 or 12 in., breadth 2.5 to 6.5 in., petiole .75 to 2 in.: the pinnate leaves with the lateral leaflets narrowly elliptic and sub-oblique, 8 to 10 in. long, and about 3 in. wide, the terminal larger, petiolules about '3 in. long; the terminal leaflet like the simple and with a petiolule 1.5 in. long. Cymes capitate, dense, about '75 in. in diam., on peduncles '5 in. or less in length. Flowers numerous, crowded, white: the lobes of the staminal tube with 2 broad deep teeth. Fruit sub-globular, '3 or '4 in. in diam., glabrous, dark-coloured and pulpy when ripe. Miq. Fl. Ind. Bat. Vol. I, pt. 2, p. 612; Ann. Mus. Lugd. Bat. I, 101; C. B. Clarke in Trim. Journ. Bot. for 1881, p. 166.

Perak: Scortechini, No. 1206; King's Collector, No. 2195.—DISTRIB. Sumatra.

4. LEEA PAUCIFLORA, King n. sp. A shrub 12 to 15 in. high; the stems slender, glabrous, sparsely lenticellate. Leaves pinnate, the rachises and petioles sub-terete; leaflets 3 to 5, oblong to elliptic-oblong, the terminal one larger and broader than the lateral, all with short rather blunt acuminate apex, the edges with a few remote shallow serrations or sometimes almost entire, the laterals slightly oblique towards the rounded or cuneate base: both surfaces glabrous and shining, the reticulations very distinct on the lower when dry: main nerves 6 to 8 pairs, faint, spreading: length of the lateral leaflets 2.5 to 4.5 in., breadth 1 to 2.5 in., the terminal one from 4.5 to 6 in. long, and from 2 to 3.5 in. broad: petiolules of the laterals 2 to 3 in. long, of the terminal about ·75 in. Cymes terminal, capitulate, densely few-flowered, about ·35 in. in diam., on pedicels '35 in. long. Colour of flowers unknown; lobes of staminal column broad, very slightly emarginate, covered with pale dots. Fruit depressed-globular, deeply lobulate, glabrous, about '4 in. in diam., white when ripe and with little pulp.

Perak: Scortechini, King's Collector, No. 1113.

This is allied to *L. simplicifolia* Zoll., but differs in its leaves which are never simple and which have 3 to 5 leaflets smaller than in the pinnate forms of *L. simplicifolia*. The cymes of this are moreover few-flowered and much smaller than in that species, and the lobes of the staminal column in this are broad and very slightly emarginate or sub-entire, whereas in *L. simplicifolia* they are more deeply bifid than in any species here described. The ripe fruit of this is moreover stated by Kunstler to be white.

5. LEEA GIGANTEA, Griff. Notul. IV, 697: Ic. Pl. Asiat. t. 645, A tall shrub or small tree; young branches puberulous, lenticellate. Leaves often several feet in length, 3-pinnate, the rachis and petiole sub-terete, not winged: leaflets oblong or elliptic-oblong, shortly and abruptly acuminate, coarsely and sharply serrate, the base cuneate; both surfaces glabrous, shining; main nerves 8 to 13 pairs, spreading; the connecting veins numerous, wavy, sub-horizontal, and very prominent on the lower surface; length 5 to 10 in.; breadth 2.25 to 4 in.: petiolules of lateral leaflets 3 to 75 in., the terminal two or three times as long. Cymes in a lax many-branched spreading panicle from 9 in. to 2 feet across, minutely puberulous or glabrescent. Flowers purplish red, the buds oblong; staminal tube with acute bifid teeth. Fruit depressed-globular, smooth, black when ripe, with scanty pulp, ·25 to ·3 in. in diam. Seeds flattened, with dorsal ridge, the sides Kurz in Journ. As. Soc. Bengal, Vol. 42, pt. 2, p. irregularly ribbed. 65; Vol. 44, Pt. 2, p. 178; For. Flora Burma, J, 280; C. B. Clarke in Trimen's Journ. Bot. for 1881, p. 140. L. Sambucina, Wall. Cat. 6823 B (in part). L. Staphylea, Wall. Cat. 6823 K.

Penang: Wallich, Stoliczka, Curtis, King. Johore; King. Perak; King's Collector, Nos. 505, 2494.

The specific name given to this is unfortunate, as it implies that the plant is a large one. As a matter of fact it is a much smaller plant than L. angulata, Korth. which often forms a tree 30 feet in height: while this is usually a shrub about 10 feet high. This species has however very much larger leaves and panicles than any other Leea known to me. The flowers of this are bluish red: the teeth of the staminal tube I find, contrary to the observations of the late Mr. Kurz and Mr. C. B. Clarke, to be bifid at the apex. My colleague Dr. Prain, to whom I have shown dissections of flowers taken from Wall. Cat. 6823B, (as well as from other specimens) quite agrees with me in this. As Mr. Clarke has remarked in his excellent Revision of the Indian Species of Leea (Trimen's Journ. Bot. for 1881, p. 100 et seq.). the characters of the seeds of this plant have given rise to some discussion. I find them to be as above described. The late Mr. Kurz (in Journ. As. Soc. Beng., Vol. 42, p. 65) described them thus: "semina obtuse carinata, lateribus tuberculato-costatis," which is a fairly accurate account of them. In a later number of the same Journal, (Vol. 44, p. 178) however, he described them in these words "seeds tubercledkeeled, the edges tubercled-ribbed," which is inaccurate. Mr. Clarke, disregarding Kurz's earlier description, and not finding the seeds of this species to agree with his later description, assumed that Kurz must have had another plant before him, and for this plant Mr. Clarke has proposed the name (Trimen's Journ. l. c.) L. tuberculo-semen. The very specimens described by Kurz as L. gigantea, Griff, are however, in the Calcutta Herbarium, and they bear that name in his own handwriting. These specimens undoubtedly agree with all the sheets of Wall. Cat. 6823B. in the same Herbarium, which Mr. Clarke regards as true L. gigan-The truth probably is that the markings on the sides of the seeds which Kurz described in two ways in the Journal of the Asiatic Society are post morten appearances—an explanation which is supported by the facts that, in his Flora of Burma, Kurz describes them in still another way as "bluntish-keeled and tubercled-ribbed;" and that nobody's description agrees with Griffith's figure (Ic. Pl. Asiat. t. 645, fig. 3) which was probably drawn from fresh seeds! Dry seeds taken from Herbarium specimens moreover vary in appearance according as they are examined immediately after having been boiled, or after some delay: and this is no doubt the explanation of Kurz's three differing descrip-The nearest ally of this species is undoubtedly L. sambucina, Willd; but that species has much smaller leaves, leaflets and panieles. and it has green not red flowers.

6. LEEA ANGULATA, Korth. ex Miq. in Ann. Mus. Lugd. Bat. I, 97. A bushy tree 20 to 30 feet high, the stem with many sharp thorns, the branches and lower part of the petioles and peduncles with a few scattered short thorns. Leaves about 1 foot long, 2- rarely 3-pinnate: the rachis angled, channelled on the upper surface, and the common petiole dilated at the base: leaflets 5, rarely 7, glabrous, narrowly oblonglanceolate, shortly acuminate, distantly serrate-crenate, the terminal one equal-sided at the base, the laterals oblique, all crenate; main nerves 5 or 6 pairs in the lateral, and 9 to 12 pairs in the terminal leaflet, spreading, slightly prominent on the lower surface but not winged or crisped; length of the laterals 1.5 to 2.5 in., of the terminal 3 to 4'5 in.; breadth '85 to 1.25 in.; petiolules '1 to 25 in. Cymes on glabrous slightly prickly peduncles 2 to 3.5 in. long, open, branching, measuring 3 in. across, almost glabrous; bracteoles minute, lanceolate, in pairs. Flowers dull white. Staminal tube 5-toothed. Berries depressed-globose, black and juicy when ripe, 35 in. in diam. L. horrida, Teysm. and Binn. (name only) Cat. Hort. Bot. Bogor. ed. 1866, p. 169. L. Malayana, Scortechini MSS. L. aculeata, C. B. Clarke (not of Blume) in Trimen's Journ. Bot. for 1881, p. 105.

Perak: Wray, Nos. 3325, 3803; Scortechini, No. 1829; King's Collector, Nos. 1145, 7066. Pahang: Ridley, No. 2583. Nicobar Islands: Kurz, King's Collector.—Distrib. Java.

This differs from *L. aculeata*, Bl. in being a larger plant and in having white, not red, flowers. *L. aculeata* has moreover simply pinuate leaves with about seven leaflets of larger size than in this; the rachis in the leaves of that moreover is not winged, nor is the base of the petiole dilated.

7. Leea sambucina, Willd. Sp. Pl. I, 1177. A shrub 4 to 10 feet high; young branches deciduously adpressed-rusty-puberulous. Leaves 15 to 20 in. long, 2- rarely 3-pinnate, the rachis and petiole not winged: leaflets oblong or elliptic, shortly and sharply acuminate, coarsely and sometimes rather unequally serrate, the base slightly cuneate; both surfaces quite glabrous; main nerves 7 to 12 pairs, rather prominent beneath, spreading; veins not prominent, transverse; length 3 to 6 or even 9 in., breadth 1.5 to 3 in.; petiolules of the lateral leaflets 2 to 4 in., the terminal one two or three times as long. Cymes on stout peduncles several inches long, (sometimes 6 in.), spreading, rather lax, almost glabrous, not usually more than 8 or 9 in. across. Flowers greenish-white, the buds sub-globular: staminal tube yellowish-white, its lobes notched. Fruit depressed-globular, smooth, black, pulp scanty, 3 in. in diam. Roxb. Hort. Beng. 18; Fl. Ind. ed. Carey II, 470; DC. Prodr. I, 633; Wall. Cat. 6823, A, C, and part of B; Blume Bijd.

196; Griff. Notul. IV, 698; Ic. Pl. Asiat. t. 644, fig. 1, t. 645, figs. 6, 8; Decne in Ann. Mus. d' Hist. Nat. III, 445; Miq. Fl. Ind. Bat. I, pt. 2, 611; in Ann. Mus. Lugd. Bat. I, 98, (only in part, and perhaps not at all); Laws. in Fl. Brit. Ind. I, 666, (partly); Brand. For. Fl. 102; Kurz in Journ. As. Soc. 44, II, 179; For. Fl. Burma I, 279; (not of Benth. nor of Baker.); C. B. Clarke in Trimen's Journ. Bot. for 1881, p. 139. L. Staphylea, Roxb. Hort. Beng. 18; Fl. Ind. ed. Carey II, 471; Wall. Cat. 6824, F. I.; W. and A. Prodr. 132; Wight Ic. 78; Dalz. and Gibs. Bomb. Fl. 41; Thwaites Enum. Pl. Zeyl. 64. L. Ottilis, DC., Prodr. I, 636. Leea viridiflora, Planch. Hort. Donat. 6. Aquilicia Sambucina, Linn. Mant. 211; Cav. Dissert. VII, t. 218. Staphylea indica, Burm. Fl. Ind. 75, t. 24, fig. 2. Aquilicia Ottilis, Gaertn. Fruct. I, 275. Ottilis zeylanica, Gaertn. Fruct. t. 57. Gastonia Naluga, Lamk. Dict. II, t. 611. Gilibertia Naluga, DC. Prodr. IV, 256. Rumph. Herb. Amb. IV, t. 45. Rheede Hort. Mal. II, t. 26.

Penang: Wallich, Curtis. Singapore: Hullett. Malacca: Maingay (Kew Distrib.), No. 433. Andaman Islands: very common.—Distrib. British India.

This species is rare in the Malayan Peninsula, but very common in the Andamans. It forms a bush of about the same size as *L. gigantea*, Griff., from which it is readily distinguished by its smaller leaves and panicles and by its green flowers. I have followed Mr. C. B. Clarke implicitly as to the synonymy of this species as given in his excellent paper in Trimen's Journal of Botany.

Var. biserrata, Miq. Ann. Mus. Lugd. Bat. I, 99. Serrations of the leaves very unequal, sometimes alternately large and small. L. biserrata Miq. Fl. Ind. Bat. Suppl. 518.

Perak: King's Collector, No. 3282. Singapore: Ridley, No. 4746. Distrib. Bangka.

8. Leea acuminata, Wall. Cat. 6830. An under-shrub 2 to 3 feet high; young branches glabrous. Leaves usually pinnate, but one of the lower pinnae often pinnulate; the rachis not winged, the petiole very slightly dilated at the base; leaflets oblong, rarely ovate-oblong, sharply acuminate, slightly and unequally serrate, the base rounded or slightly cuneate: both surfaces glabrous, sometimes dotted; main nerves 10 to 12 pairs, rather prominent beneath, the veins sub-horizontal: length 2.5 to 8 in., breadth .75 to 2 in. Cymes compact, 1.25 to 2.25 in. across, many-flowered, the branches short, minutely rusty-pubescent, on peduncles varying from 1 to 3 in. long. Flowers coral-red, sub-globular, bracts and bracteoles usually absent; lobes of the staminal tube broad, emarginate. Fruit depressed-globular, red when ripe, .25 in. in diam. C. B. Clarke in Trimen's Journ. Bot. for 1881, 102. L. sambucina, Laws.

(not of Willd.) in Hook. fil. Fl. Br. Ind. I, 666 (in part). L. laeta, Wall. Cat. 6831 A and B; Kurz in Journ. As. Soc. Beng., Vol. 42, pt. 2, p. 65; Vol. 44, pt. 2, p. 179: For. Flora Burma, I, 278; C. B. Clarke l. c., p. 103. L. sanguinea, Wall. Cat. 6824.

Andaman Islands: common.—DISTRIB. Along the base of the Eastern Himalaya, the Assam Range and Burma.

I cannot see how Wallich's two sets of specimens named *L. acuminata* and *L. laeta* are to be distinguished as species—the solitary difference which I can find between them being that, in *L. laeta* the cymes are more condensed and have shorter peduncles than in *L. acuminata*. I have therefore, in spite of the high authority of Mr. C. B. Clarke who keeps them distinct, ventured to unite them. The species, as I understand it,, is allied to *L. sambucina*, Willd., but is a much smaller plant and has coral-red, not green, flowers in rusty-pubescent condensed cymes, and red fruit.

9. Leea Curtish, King n. sp. An erect shrub 4 to 5 feet high: young shoots deciduously puberulous. Leaves 2.5 to 3 feet long, bipinate, the rachises channelled, the petiole terete; leaflets elliptic or oblong-elliptic, shortly caudate-acuminate, remotely crenate, the bases cuneate; both surfaces glabrous, the lower transversely reticulate; main nerves 5 or 6 pairs, curved, sub-ascending, prominent on the lower surface; length 3.5 to 4.5 in., breadth 1.5 to 2 in.: petiolules of the lateral leaflets about '3 in., of the terminal 1.5 in. Cymes on a long stout peduncle, umbellate, branched; the branches lax, spreading, fewflowered. Flowers large, obovoid, in pairs with deciduous bracteoles at the base. Calyx glandular-hairy, pure white, its lobes spreading. Petals reflexed, whitish-yellow, teeth of staminal tube entire. Fruit unknown.

Perak: on Waterloo Peak, alt. 1500 feet; Curtis, No. 2872.

Collected only by Mr. Curtis who describes the young leaflets as beautifully marked with silvery-grey variegations along both sides of their midribs. This appears in its foliage to resemble the imperfectly known Bornean species *L. amabilis* the leaflets of which, however, have more nerves and more serrations.

10. Leea Rubra, Blume Bijdr. 197. A shrub 1 to 6 feet high; young branches minutely scaly-pubescent, ultimately glabrous. Leaves 2- to 3-pinnate, the main rachis angled and sometimes slightly winged: leaflets 3 to 5, ovate to ovate-oblong, shortly acuminate, coarsely serrate, rounded or sub-cuneate at the base, sub-sessile; main nerves 6 to 10 pairs, winged and crisped and, in young leaves, with minute black hair along their sides, otherwise glabrous on both surfaces. Cymes on peduncles '5 to 2.5 in. long, furfuraceous rusty-puberulous, condensed

but much branched, 2 to 3 in. in diam., bracts and bracteoles absent. Flowers red. Lobes of the staminal tube notched. Berries 25 in. in diam. Dene. in Ann. Mus. d'Hist. Nat. III, 445; Hassk. Pl. Jav. Rar. 453; Miq. Fl. Ind. Bat. I, pt. 11, 610; Ann. Mus. Lugd. Bat. I, 96; Kurz in Journ. As. Soc. Beng., Vol. 44, II, 180; For. Flora Burma, I, 279; C. B. Clarke Journ. Bot. for 1881, p. 104. L. sanguinea, Kurz in Journ. As. Soc., Vol. 42, II, 66? L. coccinea, Kurz (not of Planch.)? L. polyphylla, Miq. Fl. Ind. Bat. Vol. I, pt. 2, p. 610.

Singapore: Ridley, No. 1928. Pahang: Ridley, No. 2433. Penang: Curtis, No. 1107. Quedah: King's Collector, No. 1716; Curtis, Nos. 2601 and 2645.—DISTRIB. Burma, Eastern Bengal.

This, as his specimen in Herb. Calcutta shows, is what Kurz referred to L. coccinea, Planch. (For. Flora Burmah, I, 278.)

11. LEEA ROBUSTA, Roxb. Hort. Beng. 18; Fl. Ind. ed. Carey II, 468; ed. 1832 II, 655. A shrub 5 or 6 feet high: young branches with coarse rusty deciduous pubescence. Leaves from pinnate to tripinnate, the rachis and petioles angled, minutely lepidote, not winged or dilated; leaflets oblong to elliptic-oblong, acuminate, remotely and unequally serrate (sometimes obsoletely serrate); the lower broad and rounded at the base, the terminal one cuneate: main nerves 8 to 12 pairs, ascending, the connecting veins faint; upper surface sparsely strigose; the lower shortly pubescent, eglandular, the nerves sparsely strigose. Cymes on long peduncles, sparsely umbellate, minutely tomentose; bracteoles linear, deciduous. Flowers greenish, lobes of staminal tube grooved outside but not bifid at the apex. Fruit depressed-globose, ·25 in. in diam., black when ripe, the pulp very scanty. Wall. Cat. 6826; W. and A. Prod. 132; Kurz in Journ. As. Soc. Beng., Vol. 44, pt. 2, pp. 178, 180; For. Flora Burma, I, 279; C. B. Clarke in Trimen's Journ. Bot. for 1881, p. 164. L. aspera, Wall. Cat. (not of Edgew.) 6825. L. diffusa, Laws. in Hook. fil. Fl. Br. Ind. I, 667.

Singapore: Ridley, No. 3788. Andaman Islands: King's Collectors.—Distrib. British India.

Roxburgh founded this species on specimens collected in the Northern Circars, but none of his original material is now extant. Specimens collected within recent years by Mr. J. S. Gamble in Ganjam (which is practically Roxburgh's Northern Circars) dry of a very pale colour, and have narrowly oblong leaflets with a few short hairs on the nerves beneath. In shape and colour they are distinguished from Wallich's own specimens of his L. parallela from Burma by a single character, which is that the adult leaves of L. parallela are quite glabrous beneath. But specimens recently obtained from Wallich's collecting ground in Upper Burma show that the leaflets of L. parallela are, when

young, pubescent beneath. As the only distinguishing character thus breaks down, I cannot see how L. parallela is to be kept up as a species. After examining with great care a very large suite of Indian Leeas, I cannot see how L. aspera, Edgew. and L. herbacea, Ham., are to be kept up as more than varieties of L. robusta. Mr. Curtis collected in Selangor (Herb. Curtis, No. 2329) specimens without flowers which may belong to this species. The fruit is however larger than in typical L. robusta and has the appearance of having been also more pulpy.

. 12. LEEA JAVANICA, Blume Bijd. 197. A large shrub: young branches slightly scaberulous. Leaves pinnate, the lower bi-pinnate; the rachises channelled above, not winged; petiole not dilated at the base, all deciduously and minutely tomentose: leaflets oblong or ellipticoblong, shortly acuminate, shortly serrate-dentate, the bases rounded: upper surface glabrous, the midrib and nerves puberulous: lower surface rusty-pubescent especially on the nerves, dark-red when dry: main nerves 10 to 12 pairs, spreading, curving, prominent beneath; connecting veins distinct, sub-horizontal; length 3.5 to 10 in., breadth 1.75 to 3 in.; petiolules of the lateral leaflets '15 to '25 in., of the terminal 1 in. or more. Cymes on rather short peduncles, umbellate, spreading, many-flowered, 3 or 4 in. across, minutely rusty-tomentose; bracteoles minute, deciduous. Flowers greenish-white; lobes of staminal tube broad, emarginate. Fruit depressed-globular, bluish-black when ripe. 3 in. in diam. Miq. Fl. Ind. Bat. Vol. I, pt. 2, p. 610: Ann. Mus. Lugd. Bat. I, 100; C. B. Clarke in Trimen's Journ. Bot. for 1881. p. 165.

Perak: King's Collector, Nos. 552 and 8368. Singapore: Schomburgh.—Distrib; Java, Celebes. Sumatra, Forbes, No. 1395.

This is closely allied to L. sundiaca, Mig. which however has red It is also allied to L. aeguata Linn, and to L. robusta, Roxb.

LEEA AEQUATA, Linn. Mant. 124. A shrub 4 to 10 feet high: young shoots deciduously pubescent, scaberulous. Leaves bi-pinnate, the rachises angled and pubescent, not winged, and the base of the petiole not dilated; leaflets narrowly oblong, rarely ovate-oblong, sharply acuminate, distantly and rather unequally serrate, the base usually rounded, rarely cuneate but sometimes oblique; upper surface with scattered setae especially on the midrib and nerves, otherwise glabrous; the lower surface setose-pubescent especially on the nerves, and with numerous circular discs; main nerves 7 to 12 pairs, spreading, ascending, curved; connecting veins horizontal, distinct; length 3 to 7 in., breadth 1 to 1.75 in.; petiolules of the lateral leaflets .15 to .3 in., of the terminal about 1 in. Cymes sessile or on pedancles up to 1.5 in. long, tomentose; bracts broad, caducous. Flowers white, teeth of staminal tube bifid. Fruit depressed-globular, black when ripe, pulp scanty, 25 in. in diam. Miq. in Ann. Mus. Lugd. Bat. I, 98: Kurz in Journ. As. Soc. Beng. Vol. 44, pt. 2, pp. 178, 180; Flora Burma I, 281; C. B. Clarke in Trimen's Journ. Bot. for 1881, 163. L. hirta, Hornem. Hort. Hafn. I, 237: Roxb. Fl. Ind. ed. Carey II, 469: ed. 1832 II, 656; Blume Bijdr. 197; Miq. Fl. Ind. Bat. Vol. I, pt. 2, p. 612; Wall. Cat. 6822; Dene in Ann. Mus. d'Hist. Nat. III, 446; Miq. Fl. Ind. Bat. I, pt. 2, p. 612; Lawson in Hook. fil. Fl. Br. Ind. I, 668. L. hirsuta, Bl. Bijdr.; Miq. Fl. Ind. Bat. I, pt. 2, p. 612.

Perak: Scortechini, King's Collector, No. 4387. Quedah: King's Collector, No. 1725. Andaman Islands: Kurz, King's Collector.—DISTRIB. Java, Sumatra.

This species is, as Mr. C. B. Clarke has well pointed out, at once recognisable by the curious glandular discs on the under surface of the leaf—a character found in no other species of the genus.

Order XXXIV. SAPINDACEÆ.

Trees, shrubs, or rarely climbing herbs. Leaves alternate, rarely opposite, exstipulate or occasionally stipulate, pinnate, palmate-trifoliolate or simple; leaflets opposite or alternate, entire or dentate, rarely lobed. Flowers mostly polygamo-diccious and small, usually either irregular or unsymmetrical. Calyx mostly 4-5-lobed, or with 4-5 sepals, sepals or lobes often unequal, imbricate or valvate in the bud. Petals free, equal or unequal, usually 4-5 or 0, often bearded or squamate at the base within. Disc annular or unilateral, rarely (in & flowers) deficient. Stamens 5-10, inserted inside the disc at the base of the ovary or outside or on the disc, sometimes unilateral; anthers 2-celled, basifixed or versatile; filaments often pubescent, almost always free. Ovary centric or excentric, entire or lobed, or sometimes divided nearly to the base, 1-3-celled. Style simple or divided, usually terminal; stigma usually simple. Ovules usually 1 rarely 2 or more in each cell, affixed to the axis of the ovary, ascending. Fruit capsular or indehiscent, entire or lobed, sometimes winged. Seeds globose or compressed, arillate or naked, exalbuminous, rarely albuminous. Embryo usually thick, sometimes plicate or spirally convolute.—Distrib. About 550 to 800 species scattered over the whole world.

Ovules solitary in each loculus of the ovary.

Leaves trifoliolate; inner cotyledon transversely bi-plicate; disc unsymmetrical.

Scandent tendril-bearing herbs or shrubs with 3-foliolate leaves; petals with cucullate crested scales; fruit a membranous 3-celled capsule ...

Erect shrubs or trees without tendrils; leaves 1- to 3foliolate; scales of petals emarginate; fruit (by abortion) with 2 or 1 globose indehiscent baccate cocci ...

Leaves (except in Paranephelium) equally pinnate (simple in one Aphania); cotyledons curved or sub-circinate, rarely sub-diplicolobate; disc symmetrical or unsymmetrical.

Fruit indehiscent.

Seeds without arillus.

Fruit 1- to 3-coccous, two of the segments small and imperfect or obsolete, the developed one subglobose and fleshy, testa of seed bony; sepals and petals oblong, the basal scales of the petals entire Fruit 1- to 3-lobed to the base, the lobes diverging, oblong; the testa of the seed membranous; sepals orbicular; petals obovate, their basal scale lobed... 4. Fruit deeply divided into 2 rarely 3 ellipsoid or sub-3-gonous divergent lobes united only at their bases; sepals more or less orbicular; petals smaller with 2 infolded basal auricles or with 2 basal scales 5. APHANIA. Fruit sulcate, never lobed: inflorescence often from the branches.

Fruit sub-ligneous, 3-celled, 3-angled; flowers symmetrical, scales of petals crested: lower pinnules of leaves not stipule-like ... Fruit baccate, fleshy, incompletely septate; scales of petals not crested; lower pinnules of leaves stipule-like

Seeds arillate.

fruit quite smooth

Fruit coccate or deeply sulcate, arillus adnate to the testa with a free edge round the micropyle.

Micropyle near the hilum; calyx-lobes 4 to 5, petaloid, concave, broadly imbricate; fruit muri-Micropyle remote from the hilum: calyx lobes small, valvate, petals sometimes 0; fruit muricated or tubercled or obsoletely so ... Micropyle intermediate between the base and apex of the seed; lower leaflets stipule-like;

...

Fruit dehiscent, often produced into false wings; seeds usually arillate.

Calyx polysepalous, imbricate in two series, buds sub-globose; petals with 2 crested basal scales; fruit 3-winged or 3-lobed, arillus caudate ...

1. CARDIOSPERMUM.

2. ALLOPHYLUS.

3. DITTELASMA.

ERIGOLOSSUM.

6. LEPISANTHES.

... 7. Оторнова.

... 8. XEROSPERMUM.

... 9. NEPHELIUM.

... 10. POMETIA.

... 11. Guioa.

Calyx gamosepalous, dentate or lobed; petals with two crested basal scales; fruit large, pyriform, with thick pericarp, obtusely 3-angled, not lobed ... 12. TRIGONACHRAS. Petals with 2 crestless basal scales, or sometimes absent; fruit with the cocci quite distinct and divaricate; disc sub-entire, annular. Arillus enclosing the whole or nearly the whole of the seed, not appendiculate at the base ... 13. ARYTERA. Arillus with 2 spur-like processes at its base; fruit pyriform or globose, 3-lobed 14. MISCHOCARPUS Petals peltate-infundibuliform, the single large basal scale being connate with each petal by its edges. Ovary 2-celled; fruit obovate, the pericarp coriaceous, the arillus fleshy, basal; the leaves equally pinnate, flower buds oval, pointed 15. LEPIDOPETALUM. Ovary 3-celled; fruit with the pericarp woody, tubercular or echinate; flower-buds sub-globese ... 16. PARANEPHELIUM. Ovoles 2 or more in each loculus of the ovary. Leaves simple, exstipulate: stamens inserted outside the disc; the capsule much compressed, membranous, winged, .. 17. DODONAEA. seeds ex-arillate Leaves pinnate, exstipulate; stamens inserted inside the disc; capsule coriaceous, inflated, sub-compressed, reniform, 2-celled, not winged; seeds arillate ... 18. HARPULLIA. Leaves pinnate, stipulate; stamens inserted outside the lobed disc; fruit more or less fleshy, sub-globose, 3-celled, indehiscent; seeds without arillus ... 19. TUEPINIA.

1. CARDIOSPERMUM, Liun.

Climbing tendril-bearing herbs with alternate exstipulate leaves, biternate coarsely dentate leaflets, axillary racemes, and irregular polygamo-diceious flowers. Sepals 4, imbricate, concave, the 2 outer small. Petals 4, in pairs, the larger two with a scale above the base; the two smaller inferior, remote from the stamens, each furnished with a small crested scale. Disc unilateral, undulate, almost reduced to 2 round or linear glands opposite the lower petals. Stamens 8, excentric; filaments free or connate at base; the 4 nearest to the glands shorter than the rest. Ovary sessile or sub-sessile, 3-celled; style short, trifid; ovules solitary, ascending. Capsule membranous, 3-celled, 3-valved, inflated, loculicidal. Seeds globose, usually arillate at the base, exalbuminous, testa crustaceous; cotyledons large, transversely conduplicate.—Distrib. About 30 species, mostly Tropical American and Tropical African.

CARDIOSPERMUM HALICACABUM, Linn. Sp. Pl. ed. I, 366. Annual or perennial; the branches slender, striate, sparsely pubescent or subglabrous. Leaflets deltoid, acuminate, deeply and sharply lobed, J. II. 54

glabrous or sparsely pubescent. Flowers white, '15 in. long. Capsule globose or pyriform, much inflated, veined, '75 to 1·25 in. broad. W. & A. Prodr. I, 109; Wall. Cat. 8030; Griff. Notul. IV, 546; Ic. Pl. Asiat. IV, t. 599, f. 3; Dalz. & Gibs. Bomb. Fl. 34; Wight Ic. t. 508; Thwaites Enum. 54; Roxb. Fl. Ind. II, 292; Bot. Mag. t. 1049; Grab. Cat. Bomb. Pl. 28; Boiss. Fl. Orient. I, 945; Benth. Fl. Austral. I, 453; Hiern in Hook. fil. Fl. Br. Ind. I, 670. C. microcarpum, H. B. K. Nov. Gen. & Sp. Pl. V, 104; Baker l. v. 418, with syn.—Rheede Hort. Mal. VIII, V, 28; Rumph. Herb. Amboin. VI, t. 24, f. 2.

In all the provinces, but usually only near settlements. DISTRIB. British India, Ceylon, and most tropical countries.

A form of this with rather small and ob-deltoid capsules has been kept up as a species by some authors under the name *C. microcarpum*, H. B. K.; but, as there are innumerable gradations from the globular capsule besides much difference in size, I do not consider that it deserves even varietal rank. The allied species *C. canescens*, Wall. grows in the south of India and in Burmah along with this, but is always distinguishable by its more bluntly lobed leaflets canescent beneath.

2. Allophylus, Linn.

Erect shrubs or trees. Leaves alternate, exstipulate, 1- to 3-foliolate. Racemes simple or branched, axillary. Flowers irregular, small, polygamo-diœcious, globose, sub-sessile. Sepals 4, in pairs, much imbricate, concave, unequal. Petals 4, small, glabrous, with a villous emarginate scale above the claw. Disc one-sided, with a gland opposite each petal. Stamens 8, inserted inside the disc. Ovary 2-lobed, with 2 cells and a solitary ovule in each. Style stout, stigma 2-3-lobed. Fruit bi-coccous (usually one suppressed), ovoid, epicarp dry and coriaceous. Seed with a small fleshy arillus, embryo curved, cotyledons plicate. Distrib :—about twenty-five species all tropical and mostly American.

ALLOPHYLUS COBBE, Blume Rumphia III, 131. A small tree or shrub; young branches glabrous to tomentose. Leaves 3-foliolate; leaflets ovate-lanceolate to elliptic-ovate, acute or acuminate, remotely serrate or almost entire, rarely crenate, the base cuneate often oblique and always entire: upper surface glabrous to sparsely pubescent, the lower glaberulous to tomentose; length 1 to 10 in., breadth 5 to 4 in.; lateral petiolules 2 to 3 in., the central twice as long or longer. Inflorescence 3 to 9 in. long; the flowers small, yellowish or whitish, on short pedicels. Fruit globose, 25 in. in diam., red, shining. Hiern in Hook. fil. Fl. Br. Ind. I, 673: Kurz For. Flora, Burma. I, 299. Rhus Cobbe, Linn. Sp. Pl. ed. I, 267. Ornitrophe Cobbe, Willd. Sp. Pl. II, 322; Roxb. Fl. Ind. II, 268. Usubis

triphylla, Burm. Fl. Ind. 89, t. 32, f. 1. O. Schmidelia, Pers. Syn. I, 412. Schmidelia Kobbe, Lamk. III. II, 443, t. 312, f. 2. S. Cobbe, DC. Prodr. I, 610; W. and A. Prodr. 109; Grah. Cat. Bomb. Pl. 29; Wight Ill. I, 141; Wight Ic. t. 964; Thwaites Enum. 55. Toxicodendrum Cobbe, Gertn. Fruct. I, 207, t. 44, f. 5. O. serrata, Roxb. Cor. Pl. I, t. 61; Fl. Ind. II, 266. O. serrata, DC. l.c.; Wight Ill. I, 141; W. and A. Prodr. 110; Benth. Fl. Austral. I, 455; Wall. Cat. 8061 (O. Malabarica, Hb. Madr.). S. racemosa, Linn. Mant. 67; Wall. Cat. 8059. O. Aporetica, Roxb. Hort. Beng. 28; Fl. Ind. II, 264. Aporetica ternata, J. R. and G. Forst. Charact. Gen. Pl. 132, t. 66. O. villosa, Roxb. Hort. Beng. 28; Fl. Ind. l.c. 265. S. villosa, Wight Ic. t. 401; Thwaites, l.c.; Wall. Cat. 8060. S. Rheedii, Wight Ic. t. 964; Spic. Neilgh. Bot. 33. O. glabra, Roxb. Hort. Beng. 28; Fl. Ind. l.c. 267. Allophyllus lanatus, Roxb. Hort. Beng. 88; Fl. Ind. II, 263. S. distachya, DC. l.c. 610. S. Aporetica, Wall. Cat. 8058; Kurz in Journ. As. Soc. Beng. 1870, II, 74. S. glabra, Wall. Cat. 8057; Steud. Nom. ed., 2, II, 531. Pometia ternata, G. Forst. Fl. Ins. Austr. Prodr. 74 (1786).? S. dentata, Wall. ex Voigt Hort. Sub. Calc. 93. Schmidelia (Allophyllus) ornitrophioides, Herb. Roxb.; Wall. Cat. 8055. S. adenophylla, Wall. Cat. 8063. S. vestita, Wall. Cat. 8066. S. timorensis, DC. Prodr. I, 611. S. orientalis, Sw. Fl. Ind. Occ. II, 666. S. ternata, Cambess. in Mém. Mus. Par. XVIII, 24. O. asiatica, Hort. ex Steud. Nom. ed. 2, II, 230.—Rheede, Hort. Mal. V, t. 25.

In all the Provinces.—DISTRIB. British India, the Malayan Archipelago.

A widely distributed and, within certain limits, a variable species to which a variety of names have been given. The synonymy has been most carefully gone into by Mr. Hiern, whose summary of it I have copied bodily from the Flora of British India.

Mr. Hiern has prepared the following table of varieties, which I also copy:—

"Leaflets oval or ovate.

Glabrescent or somewhat hairy.

Leaflets crenate-dentate. Bracts short ... racemosa. Leaflets serrate-denticulate. Bracts subulate serrata. Shoots and leaves very hairy ... villosa. Leaflets oval-oblong or lanceolate-acuminate. Leaflets subentire or serrulate. Bracts short glabra. Leaflets acutely serrate. Bracts long, linear Aporetica. Racemes simple, 2 together. Petals not declinate, but the place of the fifth petal vacant distachya. Racemes branched, solitary ... Rheedii."

3. DITTELASMA, Hook. fil.

A tree. Leaves alternate, pinnate, exstipulate; leaflets subopposite or alternate, entire. Panicles terminal, bracteate. Flowers polygamomonœcious. Sepals 5, oblong, rounded at the apex, unequal. Petals 4, erect, oblong, concave, tomentose outside, the place of the fifth vacant; scale large obovate-oblong, densely shaggy-crested, incurved at the apex. Disc semilunate-annular, much wider at one side, glabrous. Stamens 8, inserted around the base of the ovary, unequal; filaments villous, slender at the tip; anthers small, shortly exserted. Ovary sub-globose, glabrous, 3-lobed, 3-celled, contracted at the apex into a short erect style, stigma shortly 3-lobed; ovule solitary in each cell. Fruit 1-3-coccous, 2 segments usually smaller or obsolete, rather fleshy, indehiscent. Seed globose, exarillate, exalbuminous; testa thick, bony; embryo curved; cotyledons large, unequal, incurved; radicle short, incumbent.—Distribe. A single species.

DITTELASMA RARAK, Hook, fil. in Benth. and Hook, fil. Gen. Plantar. I, 396. A tree 50 or 60 feet high; young branches stout, with pale puberulous bark. Leaves 10 to 18 in. long; leaflets 6 to 12 pairs, usually oblong-lanceolate, rarely oblong-oblanceolate, often slightly oblique, the apex acute, the base cuneate, quite glabrous; main nerves numerous, faint; length 3 to 4 in., breadth '75 to 1.5 in., petiolule '1 in. or less. Panicles terminal, erect, many-branched, puberulous, usually shorter than the leaves. Flowers '2 in. long, pale yellow or white. Hiern in Hook, fil. Fl. Br. Ind. I, 672; Kurz For. Flora Burma, I, 297. Sapindus Rarak, DC. Prodr. I, 608; Blume Rumph. III. 93, t. 197. ? S. pinnatus, Mill. Gard. Dict. No. 3. S. saponaria, Lour. Fl. Cochinch. 238 (not of Linn.)—Rumph. Herb. Amboin, II, 134.

Malacca: Griffith, Maingay.—Distrib. Burma, Cochin-China, Java.

4. ERIOGLOSSUM, Blume.

Trees or shrubs. Leaves unequally-pinnate, exstipulate, alternate. Leaflets opposite or subopposite, entire. Panicles terminal, erect, with elongated racemose branches. Flowers polygamo-diœcious, irregular, white. Sepals 5, unequal, orbicular, concave, imbricated, the two outer ones smaller. Petals 4, unequal, obovate, clawed, the place of the 5th vacant; scale hairy, hooded, with an apical lobed appendage. Disc onesided, lobed. Stamens 8, turned to one side; filaments unequal, hairy, anthers sub-exserted. Ovary stipitate, obcordate, 3-lobed, 3-celled; style slender, stigma obscurely 3-lobed; ovules solitary in the cells of the ovary, ascending. Fruit 1-3-lobed to the base; the lobes oblong, indehiscent, diverging. Seeds oblong, exarillate, exalbuminous, testa mem-

branous; embryo straight; cotyledons thick.—DISTRIB. Species 4, three tropical Asiatic and one African.

ERIOGLOSSUM EDULE, Blume Bijdr. 229. A large shrub or tree; young shoots petioles and rachises of leaves and inflorescence more or less rusty-pubescent. Leaves 8 to 20 in. long; leaflets 4 to 13, oblonglanceolate to elliptic, acute or acuminate, slightly oblique especially at the cuneate base, upper surface sparsely puberulous to glabrescent, the midrib tomentose; the lower softly tomentose to glaberulous and usually dark-coloured; main nerves 6 to 10 pairs, length 2.5 to 7 in., breadth ·75 to 2·25 in. Panicles sometimes longer than the leaves. Flowers on short pedicels, clustered, sub-globular, '1 to '15 in. in diam. Fruit glabrous, the lobes oblong, '4 in. long. Benth. Fl. Austral. I, 454; Hiern in Hook. fil. Fl. Br. Ind. I, 672. E. rubiginosum, Brand. For. Fl. 108. Pancovia rubiginosa, Baill. Kurz For. Flora Burma, I, 296. Moulinsia cupanioides, Cambess. in Mém. Mus. Par. XVIII. 27, 40, t. 2. Sapindus rubiginosa, Roxb. Cor. Pl. I, 44, t. 62; Fl. Ind. II, 282; W. and A. Prodr. I, 112; Grah. Cat. Bomb. Pl. 29; Wall. Cat. 8041; Griff. Notul. IV, 548; Dalz. and Gibs. Bomb. Fl. Suppl. 14; Wall. Cat. 8041D. S. fraxinifolius, DC. Prodr. I, 608. M. rubiginosa, G. Don. Gen. Syst. I, 667. S. longifolius, Wall. Cat. 8046.

In all the Provinces: rather common.

5. APHANIA, Blume.

Trees or shrubs with pinnate (usually equally) exstipulate rarely with simple leaves; leaflets 1 to 6 pairs. Flowers in panicles or racemes. Sepals 4 or 5, widely imbricate. Petals 4 to 6, small, with infolded basal auricles or with a basal scale. Disc regular, slightly lobed. Stamens 5, rarely 3. Fruit deeply divided into 2 (rarely into 3) ellipsoid or sub-3-gonous divergent lobes united only at the base; the endocarp thin cartilaginous or crustaceous.—Distrib. about 12 species, tropical Asiatic and African, one in New Guinea.

Leaves pinnate.

Inflorescence racemose ... 1. A. paucijuga.
Inflorescence paniculate ... 2. A. montana.
Leaves simple ... 3. A. Danura.

1. APHANIA PAUCIJUGA, Radlk. in Sitzb. Bayer. Akad. Math. Phys. IX, (1878), 239. A tree 60 feet high; young branches cinereous-puberulous or glabrous. Leaves 5 to 8 in. long, their rachises with 3 faint ridges on the upper surface: leaflets 2 to 4, opposite, oblong-lanceolate or elliptic-lanceolate, bluntly acuminate, much narrowed at the base; both surfaces quite glabrous, the upper shining, the lower paler and dull; main nerves 6 to 8 pairs, spreading, not conspicuous:

length 3.5 to 8.5 in., breadth 1.2 to 3 in., petiolules 2 in. Racemes solitary or in pairs, axillary, usually longer than the leaves, slender, adpressed-puberulous, sparsely flowered: pedicels slender, bracteoles minute. Flowers globular before expansion, 15 in. in diam. Sepals 5, red, orbicular, slightly concave, much imbricate. Petals smaller than the sepals, the edges infolded at the base so as to simulate 2 scales, sometimes absent. Stamens 8, inserted inside the pentagonous disc; filaments hairy at the base; anthers short, ovate, obtuse. Ovary stalked, compressed, broadly ovate, with short glabrous sub-connate styles, 2-celled. Fruit deeply 2-lobed; the lobes divergent, obovate, each 25 in. long, style persistent between the bases of the lobes. Otophora paucijuga, Hiern in Hook. fil. Fl. Br. Ind. I, 680.

Malacca: Maingay, No. 462. Perak: Scortechini, No. 1674.

The leaflets in Scortechini's specimens are rather larger than in Maingay's; in other respects they agree.

2. APHANIA MONTANA, Blume Bijdr. 236. A shrub; young branches glabrous, minutely lenticellate. Leaves 6 to 12 in. long, unequally pinnate: leaflets 3 to 5, elliptic to oblong, sub-acute, the base cuneate, both surfaces glabrous and minutely reticulate; main nerves 8 to 10 pairs; length 4.5 to 6 in., breadth 1.75 to 3 in., petiolules 25 in. Panicles axillary, 4 to 9 in. long, solitary or in fascicles of 2 or 3, each with a few lax raceme-like branches, rusty-puberulous. Flowers about 25 in. in diam. Sepals 4, in decussate pairs, ovate-rotund. Petals 4, ovate, glabrous, the edges fimbriate like those of the sepals; each with a short fimbriate basal scale. Disc fleshy, lobed, sub-pubescent. Stamens 8, with short thick pubescent filaments inserted inside the disc: anthers ovate, slightly sagittate. Ovary 2-celled; style short, glabrous. Fruit 1- usually 2-coccous, fleshy, glabrous: the cocci divaricate, ellipsoid, about 5 in. long. Sapindus montanus, Blume Rumphia, 197: Miq. Fl. Ind. Bat. I, pt. 2. p. 552.

Nicobar and Andaman Islands: King's Collectors. Nicobars: Jelinek.

3. APHANIA DANURA, Radlk. über die Sapind. Holländ-Indiens, 69. A shrub, all parts except the inflorescence glabrous. Leaves simple, sub-verticellate or alternate, sub-coriaceous, oblong, elliptic, oblanceolate or obovate, acute or acuminate, narrowed to the sometimes cordate base: both surfaces reticulate and shining; main nerves 10 to 16 pairs, faint, spreading; length 8 to 12 in., breadth 1.5 to 3.5 in.; petiole 3 in. to 1 in., stout. Paniele terminal, on a long peduncle, puberulous; the branches spreading, divergent. Flowers numerous, pink, bracts minute. Sepals 5, unequal, sub-rotund, concave. Petals 5, equal, ovate, emarginate, each with a bifid woolly scale at its base. Disc annular. Stamens

6 to S. Ovary 2-celled, stigma bifid. Fruit 2-coccous; each coccus ellipsoid, pulpy, '35 to '5 in. long. Sapindus Danura, Voigt Hort. Bot. Suburb. Calc. 94: Hiera in Hook. fil. Fl. Br. Ind. I, 684; Kurz For. Flora, Burma, I, 298. Scytalia Danura, Roxb. Hort. Beng. 29; Fl. Ind. II, 274. Sc. verticillata, Roxb. Hort. Beng. 29; Fl. Ind. II, 273. Euphoria verticillata, Lindl. Bot. Reg. t. 1059; Wall. Cat. 8052 A, B, C. Dimocarpus verticillata, Hb. Roxb. ex Wall. l.c. A. Nephelium verticillatum, G. Don Gen. Syst. I, 670. E. Danura, Wall. Cat. 8051. Didymococcus Danura, Blume Rumph. III, 103. D. verticillatus, Blume l.c.

Nicobar Islands; Kurz.—DISTRIB. British India.

6. LEPISANTHES, Blume.

Trees or shrubs. Leaves pinnate, exstipulate, alternate; leaflets entire, subopposite. Inflorescence axillary or lateral, in paniculate spikes. Flowers regular or irregular, polygamo-diecious. Sepals 5-4, widely imbricated in two rows. Petals 5-4, equal, each having at the base one or two short wide inflected scales. Disc annular, regular or irregular (one-sided). Stamens 8 or 10, erect, inserted within the disc. Ovary sessile, 3-sided, 3-celled; ovules solitary; style simple; stigma blunt or trigonous. Fruit 3-celled, 3-sided, not lobed. Seeds solitary, erect, exalbuminous; cotyledons very thick, unequal.—Distrib. about 16 species, tropical Asiatic.

Panicles 9 to 12 in. long.

Fruit 1.5 in. in diam. ... 1. L. Kunstleri. Fruit 8 in. in diam. ... 2. L. andamanica.

Panicles 1 to 3 in. long.

Leaflets 4 to 9 in. long ... 3. L. cuneata.

Leaflets 12 to 18 in. long.

Fruit tomentose but not echinate ... 4. L. Scortechinii. Fruit tomentose and echinate ... 5. L. longifolia.

1. Lepisanthes Kunstleri, King n. sp. A tree 30 to 60 feet high; young branches stout. Leaves 30 to 40 inches long, their rachises glabrous: leaflets about 12, subopposite, oblong or elliptic-oblong, shortly cuspidate, the base rounded, both surfaces glabrous and reticulate; main nerves 9 to 13 pairs, spreading slightly, ascending; length 6 to 12 in., breadth 2·5 to 3·5 in.; petiolules 3 to 4 in., stout. Panicles slightly supra-axillary, erect, few-branched, shortly pedunculate, 9 to 12 in. long: ultimate branchlets cymose, 3- to 5-flowered, minutely tomentose. Flowers 4 in. long, globular in bud. Sepals 5, concave, minutely tomentose outside. Petals 5, sericeous in the lower half externally, glabrous in the upper, each with an inflected glabrous bifid basal scale. Stamens 8, the filaments sericeous. Disc semi-lunar, glabrous.

Ovary (in male flower) rudimentary. Fruit sub-globular, with or 3 broad rounded angles, densely rusty-tomentose, 1.5 in. in diam., the pericarp crustaceous: seeds 3, large.

Perak: King's Collector, Nos. 4634, 7359.

This resembles L. montana to some extent; but has much larger leaves, a more robust and longer inflorescence and larger flowers and fruit. I have not seen female flowers and therefore cannot describe the ovary.

2. LEPISANTHES ANDAMANICA, King n. sp. A tree? young branches pale when dry, glabrous like all the other parts except the inflorescence. Leaves 7 to 12 in. long, equally pinnate: leaflets 2 to 4, coriaceous, pale when dry, elliptic-oblanceolate, subacute, slightly oblique and much narrowed to the base, both surfaces minutely reticulate; main nerves 5 to 8 pairs, spreading, slightly prominent beneath: length 4 to 7 in., breadth 1:35 to 2:75 in.; petiolules :2 to :5 in., stout. Panicles 8 to 10 in. long, with 3 or 5 narrow raceme-like puberulous branches, the ultimate branchlets being few-flowered cymelets. Flowers .25 in. in diam., pedicellate. Sepals 5, unequal, obovate, blunt, tomentose outside. Petals 5. narrowly oboyate-oblong, glabrous with a villous claw and a large oblong basal scale. Stamens 8, the anthers glabrous and short, the filaments long and villous. Fruit sub-globular, with 3 deep vertical ridges, minutely tomentose, slightly apiculate and with a short thick pseudo-stalk, 3celled, 3-seeded; the pericarp crustaceous, '8 in. long, and about as broad.

Andaman Islands: King's Collector.

3. LEPISANTHES CUNEATA, Hiern in Hook. fil. Fl. Br. Ind. I, 680. A shrub; young branches tawny-puberulous. Leaves 15 to 30 in. long, the rachises puberulous or minutely tomentose; leaflets 10 to 14, subopposite or alternate, oblong or elliptic-oblong, the apex bluntly and shortly cuspidate, the base much narrowed; both surfaces reticulate, the lower slightly puberulous towards the base; main nerves 8 to 14 pairs, spreading, curving upwards, rather prominent beneath; length 4 to 9 in., breadth 1.5 to 2.75 in., petiolules .25 to .35 in. Panicles narrow and spike-like, in fascicles of 3 to 5, axillary or slightly above the leaves, 1 to 3 in. long. Flowers 1 in. in diam.; bracteoles subulate, minute. Sepals sub-rotund, puberulcus. Petals 5, glabrous, each with a single inflected scale at its base. Fruit broadly ovoid, compressed, with a vertical groove, densely and minutely cinereous-tomentose, crowned by the persistent style and obscurely 2-lobed stigma, two-celled and with a single seed in each cell, 25 in. broad and about the same in length.

Penang: Porter, Curtis, No. 3009. Perak: Wray, Nos. 1400, 1990, 3563: King's Collector, Nos. 3059, 7072.

4. Lepisanthes Scortechinii, King n. sp. A tree? Leaves 2 to 3 feet long, abruptly pinnate: leaflets usually 8, sub-opposite, ellipticoblong, the apex shortly acuminate, the base slightly caneate; both surfaces glabrous except the midrib and nerves on the lower; main nerves 12 to 14 pairs, spreading, bold beneath and puberulous; length 12 to 18 in., breadth 5 to 7 in.; petiolules '75 to 1 in. long, stout. Panicles narrow, raceme-like, axillary, only 2 in. long, pubescent; bracts and bracteoles narrow, '25 in. long; pedicels hairy, '25 in. long: flowerbuds sub-compressed, '3 in. in diam. Sepals 5, concave, widely imbricate. Petals 5, each with a recurved scale at its base. Disc glabrous. Stamens 8, the filaments hairy, the anthers oblong. Rudimentary ovary (in male flower) hairy. Fruit sharply 3-angled, with three deep vertical grooves, densely but minutely rusty-tomentose, 1 in. long and about as broad.

Perak: Scortechini, No. 2090.

Fr. Scortechini's specimens are in fruit only. The above description of the flower has been compiled from his field notes on his specimens. The species is notable for its large leaflets.

5. Lepisanthes longifolia, Radikofer über die Sapindaceen Holländisch-Indiens, p. 35. A shrub 8 to 20 feet high: young parts and inflorescence minutely rusty-tomentose. Leaves 2 to 2.5 feet long; leaflets about 6, opposite or sub-opposite, narrowly oblong, shortly acuminate or acute, the base narrowed, glabrous on both surfaces; main nerves 14 to 18 pairs, spreading; length 12 to 15 in., breadth 2 to 4 in.; petiolules 4 to 8 in., puberulous like the rachis. Racemes solitary or crowded, sometimes branched, axillary or supra-axillary, 2 to 3 in. long. Flowers 5 in. long, tomentose; bracteoles subulate, about 15 in. long. Petals 5, obovate-oblong; the basal scale single, short, hairy, flat, entire or bifid. Fruit depressed-globular, trigonous and with 3 broad vertical furrows, softly echinate and densely rusty-tomentose, length 1 in., breadth about 8 in. Hemigyrosa longifolia, Hiern in Hook. fil. Fl. Br. Ind. I, 671.

Malacca: Griffith, Maingay, No. 446. Perak: King's Collector, Nos. 5539, 8465, 10220.

An uncommon tree of which only a few specimens exist in collections.

7. OTOPHORA, Blume.

Trees or shrubs. Leaves alternate, pinnate, stipulate; leaflets entire. Inflorescence axillary and terminal. Flowers regular, polygamous. Sepals 4 or 5, concave, widely imbricated. Petals 5, rarely 4, smaller than the sepals, somewhat squamate by inflexion of the subauriculate

base. Disc complete, annular, crenulate or entire. Stamens 8-9 rarely 5, inserted within the disc; filaments very short; anthers oblong, included. Ovary ovate or elliptic, 2- to 3-celled; ovules solitary, ascending; stigma subsessile, obtuse, obsoletely 3-4-rayed. Fruit baccate, not lobed, indehiscent, 3-4- or by abortion 2-1-celled; seeds arillate; embryo straight; cotyledons thick.—Distrib. Species about 12, confined to the Malay Peninsula and Archipelago.

Leaflets sessile 1. O. sessilis.
Leaflets petiolulate 2. O. erythrocalyx.

1. Otophora sessilis, King n. sp. A shrub or small tree. Leaves 30 or 40 in. long, the base of the petioles slightly swollen: leaflets about 10 or 12, sessile, alternate or sub-opposite, coriaceous, broadly oblong or elliptic-oblong, shortly cuspidate, the base slightly narrowed and often minutely cordate: both surfaces glabrous and reticulate, the upper olivaceous when dry, the lower pale brown: main nerves 9 to 15 pairs, spreading, slightly prominent on both surfaces; length 8 to 12 in., breadth 2.75 to 4 in.; stipules at the very base of the petiole, ovate-rotund, 2 to 2.5 in. long. Panicles axillary, 8 to 10 in. long, consisting of 2 or 3 narrow raceme-like branches. Flowers 25 in. in diam., polygamous. Sepals 4, obovate or sub-rotund. Petals 4, elliptic, with inflexed scale-like sericeous bases. Stamens 6, with short glabrous filaments. Fruit ellipsoid, compressed, glabrous, not lobed, nearly 1 in. long and about half an inch broad.

Perak; King's Collector, Nos. 2460, 5043.

This resembles O. erythrocalyx, Hiern, but has sessile leaflets which, as well as the stipules, are moreover larger than those of O. erythrocalyx.

2. Otophora erythrocalyx, Hiern in Hook. fil. Fl. Br. Ind. I, 680. A small glabrous tree. Leaves 30 to 45 in. long, the petioles thickened at the base: leaflets 14 to 19, coriaceous, opposite or alternate, ellipticoblong to elliptic, shortly cuspidate, the base cuneate, both surfaces glabrous and reticulate, the upper olivaceous, the lower brown when dry; main nerves 10 to 13 pairs, spreading, prominent beneath: length 5 to 8 in., breadth 1.5 to 3 in.; petiolules 4 in., stout: stipules ovate, 6 in. long. Panicles large, many-branched, 20 to 30 in. long (or even longer), pedicels slender. Flowers 15 to 2 in. long, on slender pedicels. Sepals 5, red. Petals 5, pale-rose-coloured, each with short inflexed basal scales. Stamens 8, filaments thick and hairy; anthers pointed, hairy. Disc glabrous. Ovary 3-gonous, glabrous, the stigma sessile, 3-grooved. Fruit ovoid, 3-gonous, glabrous, 1.5 in. in diam., 3-celled; seeds arillate.

Malacca: Maingay, No. 447.

8. XEROSPERMUM, Blume.

Trees. Leaves alternate, exstipulate, abruptly pinnate; leaflets opposite, entire. Racemes axillary and terminal. Flowers regular, polygamo-diœcious. Sepals 4-5, imbricated in 2 rows. Petals 4-5, equal, spathulate, shorter or but little longer than the sepals, without basat scales. Stamens 8-7, included, inserted within the annular glabrous disc. Ovary sessile, didymous, muricated, 2-celled; ovules solitary in each cell, ascending. Style short, thick; stigma thick, hairy. Fruit 1-2-lobed; the lobes ellipsoidal, diverging, muricated with pyramidal tubercles, indehiscent, glabrous inside. Seeds exarillate; testa coriaceous outside, fleshy, pilose, simulating an aril; embryo curved; cotyledons very large, thickly fleshy, superposed.—Distrib. 3 or 4 species all Malayan.

Sepals and petals 5; leaflets only a single pair 1. X. laevigatum.

Sepals and petals 4; leaflets 1 or 2 pairs.

Leaflets 3 to 6 in. long, minutely reticulate; fruit ellipsoid, muricate, not compressed Leaflets 4·5 to 8 in. long, transversely reticulate; fruit obliquely elliptic, compressed 3. X. Wallichii.

1. Xerospermum Laevigatum, Radlk. in Sitzb. Bayer. Akad. Math. Phys. 1878, p. 305. A perfectly glabrous tree. Leaves about 4 in. long, with only a single pair of coriaceous elliptic-oblong minutely reticulate shortly acuminate leaflets, 2·25 to 3 in. long and 1 to 1·25 in. broad; their petiolules about ·2 or ·25 in. long, slender. Racemes terminal and axillary, usually in fascicles of 2 or 3, often with a few branchlets. Flowers about ·15 in. in diam., or slender pedicels. Sepals 5, rotund, glabrous. Petals 5, spathulate, the limb densely woolly, the claw slender. Stamens 5; the filaments long and woolly, the anthers small and glabrous. Disc annular, fleshy, glabrous, waved. Ovary tomentose, 2-celled. Fruit with 2 or usually only with 1 sharply muricate obovate-ellipsoid compressed coccus, 1·35 in. long and ·85 in. broad.

Malacca: Griffith (Kew Distrib.), No. 1006/1. Penang: Curtis, No. 846. Perak: Scortechini, No. 1019. Pahang: Ridley, No. 2641.

2. Xerospermum muricatum, Radlk. über die Sapind. Holländ.-Indiens, 37, 70. A tree 50 to 80 feet high: branches glabrous, dark-coloured when dry. Leaves 4 to 9 in. long, equally pinnate: leaflets 2 or 4, elliptic-oblong to elliptic, shortly acuminate, the base cuneate; both surfaces glabrous and minutely reticulate: main nerves 7 to 9 pairs, ascending, depressed on the upper, prominent on the lower surface:

length 3 to 6 in., breadth 1.35 to 2 in., petiolules .35 in. Racemes axillary, usually with a few short branchlets, bracteoles small, pedicels as long as the flower-buds. Flowers .2 in. in diam. Sepals 4, rotund, nearly glabrous but with ciliate edges. Petals 4, shorter than the sepals, the limb rusty-villous. Disc fleshy, waved. Stamens 8, the filaments pubescent towards the apex, the anthers glabrous. Fruit usually reduced by abortion to only one lobe, sharply muricate, 1.25 in. long and .75 in. in diam. Xerospermum Norhonianum, Hiern (not of Blume) in Hook. fil. Fl. Br. Ind. I, 686 (in part); Kurz For. Flora Burma, I, 295. Nephelium muricatum, Griffith MSS.

Malacca: Griffith, No. 1004; Maingay, Nos. 444 and 458 also 443 in part; Derry. Perak: very common, King's Collector, Scortechini. Singapore: Ridley.—DISTRIB. Burma.

Though closely allied to X. Norhonianum Radlk. this has more sharply muricated fruit.

2. XEROSPERMUM WALLICHII, King, n. sp. A tree 30 to 40 feet high; young branches glabrous, dark-coloured when dry. Leaves 12 to 18 in. long, equally pinnate; leaflets two pairs, coriaceous, elliptic or obovate-elliptic, shortly and bluntly cuspidate, much narrowed below the middle to the base, both surfaces glabrous and transversely reticulate: main nerves 5 to 7 pairs, depressed on the upper prominent on the lower surface, ascending; length 4.5 to 8 in., breadth 2.25 to 4 in.; petiolules 25 to 45 in., stout. Racemes axillary, 2 to 4 together. 1 to 2 in. long. Flowers 15 in. in diam. when open, pedicellate. Sepals 4, rotund, concave, glabrous but with minutely ciliate edges. Petals 4, smaller than the sepals, sub-rotund, with very short claws, densely lanate. Stamens 8; filaments short and lanate, anthers short and glabrous. Disc annular, glabrous, fleshy. Ovary broad, compressed, 2lobed and 2-celled, pubescent. Fruit usually with 2 cocci but often with only one, obliquely elliptic, slightly compressed, rarely sub-globular. minutely rugulose, not muricate, when ripe 1.25 in. long and .75 in. broad. Wall. Cat. Nos. 8083, 8084.

Singapore and Penang: Wallich. Perak: Wray, Nos. 3419, 3580: King's Collector, Nos. 8725, 10611, and 10945. Pahang: Ridley, No. 2570.

Ridley's Pahang specimen has nearly globular fruit. But in other respects it exactly resembles those from the other provinces.

9. NEPHELIUM, Linn.

Trees or shrubs. Leaves alternate, exstipulate, pinnate, the leaflets entire. Inflorescence terminal and axillary, paniculate or paniculateracemose or racemose. Flowers regular, polygamous. Calyx 4- to 6-

lobed, usually cupular, sub-valvate in bud. Petals small, villous, rarely with 2 scales, often absent. Stamens 6 to 8, inserted within the fleshy glabrous or pubescent disc; filaments usually pubescent. Ovary pubescent, often verrucose or setose, 1-2- or rarely 3-lobed, the lobes with 1 cell and 1 ovule. Fruit 1- rarely 2-coccous, indehiscent, oblong or globose, echinate, tubercled or smooth. Seed ellipsoid or globose, covered by a pulpy arillus; cotyledons fleshy, not folded.—Distrib. About twenty species chiefly Malayan.

Besides the ten species described below, there are in the Calcutta Herbarium specimens of six other species which I am unable to identify with any published species but which, for want either of flowers or of fruit, I am unable to describe.

Leaflets quite glabrous on both surfaces.

Leaflets quite glabrous on both surfaces.		
Fruit rugulose but not at all spiny.		
Leaflets elliptic, fruit gibbous at the base	1.	N. glabrum.
Leaflets oblong or ovate-lanceolate, fruit		
not gibbous at the base	2.	N. Longana.
Fruit with short glabrous spines	3.	N. rubescens.
Fruit with long sub-compressed puberulous		
flexuose stout setae	4.	N. lappaceum.
Leaflets glabrous on the upper surface, sub-		
glaucous and minutely puberulous on the lower		
surface, never rusty; fruit covered with stout		
woody spines.		
Petals 5	5.	N. costatum.
Petals 0.		
Leaflets with 9 to 13 pairs of main nerves	6.	N. chryseum.
Leaflets with 16 to 24 pairs of main nerves	7.	N. hamulatum.
Leaflets glabrous on the upper surface, the		
lower surface more or less rusty-puberulous or		
pubescent.		
Petals 0; fruit densely covered with flexuose		
compressed soft spines	8.	N. ophiodes.
Petals 5.		
Leaflets oblong, rarely obovate-oblong;		
fruit densely covered with flexuose com-		
pressed soft spines	9.	N. eriopetalum.
Leaflets elliptic, fruit slightly tubercled or		
almost smooth	10.	N. malaiense.
		N. sufferugineum.
1. NEPHELIUM GLABRUM, Noronha in Batav. Genootsch. Nerh. V,		
80. A tree 60 to 80 feet high; young branches glabrous. Leaves 7 to		

11 in, long: leaflets 4 to 6, coriaceous, elliptic, acute or very shortly and

bluntly acuminate, entire, the base cuneate: both surfaces glabrous and reticulate; main nerves 8 to 10 pairs, spreading and curving upwards; length 3 to 4.5 in., breadth 1.5 to 2.25 in., petiolules .4 to .6 in. Panicles shorter than the leaves, formed of several slender pubernlous raceme-like branches bearing the flowers in few-flowered cymules. Flowers less than ·1 in. in diam., dicecious. Male flower: sepals 5, rotund, pubescent; petals 0; stamens 6 or 7, the filaments pubescent, exserted; the overy rudimentary. Female flower: calyx 5-toothed, pubescent; stamens not exserted, the filaments very short; ovary obovate-oblong, 1-celled (the other cell aborted) rugulose, pubescent; the style from the base of one side of it, recurved at the apex, not bifid. Fruit narrowly oblong or clavate, slightly gibbous at the base, sub-glabrous, rugulose but not echinate, 1 in. or more in length, and '6 or '7 in. broad. Reinw. in Blume's Cat. Hort. Bot. Bogor.; Hassk. Pl. Jav. Rar. 290; Hiern in Hook. fil. Fl. Br. Ind. I, 687. Euphoria glabra, Bl. Bijdr. 233. Nephelium Maingayi, Hiern in Hook. fil. Fl. Br. Ind. I, 688. N. lappaceum, Linn. var. glabrum, Bl. Radlk. über die Sapindac. Holländisch-Indiens, 73, 74.

Malacca: Griffith, Maingay, Derry, Nos. 60, 1171. Singapore: Ridley, Nos. 6210, 6212, 6531, 6070. Perak: Scortechini; King's Collector, Nos. 1058, 3789, 5346, 10621.

This species differs from N. lappaceum in so many respects that I cannot at all agree in the view, even although it be held by so great a master of the order as Professor Radlkofer, that it is a mere variety of that species. The one-celled ovary, single style and stigma appear to me to distinguish it at once, not to mention the absence of setae on the ripe fruit and the more slender inflorescence and smaller flowers.

2. Nephelium Longana, Camb. in Mém. Mus. Par. XVIII, 30. A tree 30 to 40 feet high: young shoots rusty puberulous. Leaves 4 to 18 in. long, equally or unequally pinnate, the rachis rusty-puberulous when young afterwards glabrous: leaflets coriaceous, oblong or ovate-lanceolate sometimes slightly oblique, shortly acuminate, the base cuneate: both surfaces glabrous and reticulate, the lower glaucous; main nerves 10 to 14 pairs, spreading, rather prominent beneath; length 2.5 to 7 in., breadth 1 to 2 in., petiolales 3 to 5 in. Panicles terminal and axillary, many-branched, puberulous; branches raceme-like, with ultimate lateral condensed cymules. Flowers pedicelled, about '15 in. in diam. Calyx tomentose, deeply 5- to 6-lobed. Petals 5 or 6, linear-spathulate, pubescent, nearly as long as the calyx-lobes. Stamens 6 to 10, included in the female exserted in the male flowers, the filaments pilose towards the base; authers short and glabrous. Ovary 2-3-lobed, tubercled. Fruitlobe usually solitary by abortion, globular or (in var. hypoleuca) ovoid, the epicarp yellowish-red and muricate-areolate, when globose 5 to 75

in. in diam. Seed solitary, enveloped in a fleshy pale sub-acid arillus. Bot. Mag. t. 4096; W. and A. Prodr. 113; Grah. Bomb. Pl. 29; Blume Rumph. III, 108; Dalz. and Gibs. Bomb. Fl. 35; Thwaites Enum. 58; Miq. Fl. Ind. Bat. I, Pt. 2, 556; Hiern in Hook. fil. Fl. Br. Ind. I, 688, (in part); Trimen Flora Ceylon, I, 309. N. Mora, Gardn. ex Thwaites l. c. N. Bengalense, G. Don Gen. Syst. I, 570. Scytalia bengalensis, Roxb. ex G. Don l. c. Sc. Longan, Roxb. Hort. Beng. 29; Fl. Ind. II, 270. Dimocarpus Longan, Lour. Fl. Cochinch. 233; Trans. Hort. Soc. II, t. 28. Euphoria Longana, Lamk. Dict. III, 574; Bot. Reg. t. 1729; Bedd. Fl. Sylv. t. 156; Wall. Cat. 8049. Sapindus bengalensis, Roxb. ex W. and A., l. c. Dimocarpus undulatus, Wight ex W. and A., l. c. E. undulata, Hb. Heyne ex Wall. l. c. S. monogyna, Hb. Heyne l. c. D. pupilla, Moon Cat. 31. N. pupillum, Wight III. I, 141. Euphoria pupillum, Steud. Nom. ed. 2, II, 192.

In most of the Provinces, but probably cultivated.—DISTRIB. The Tropics generally.

Var. hypoleuca, King. Fruit ovoid, 1 to 1.5 in long. N. hypoleucum, Kurz in Journ. As. Soc. Bengal for 1871, II, 50: for 1874, II, p. 183: and for 1875, II, p. 187; For. Flora Burma, I, 293: Radlk. Sapind. Holl.-Ind. 28.

Malacca: Maingay, No. 440.—DISTRIB. Burma.

Hiern reduces N. hypoleucum without recognising it as even a variety. Radlkofer, on the other hand regards it as a distinct species. But beyond its oval fruit, I do not see how it differs from typical N. Longana, L., and I therefore treat it as a variety of the latter.

3. NEPHELIUM RUFESCENS, Hiern in Hook. fil. Fl. Br. Ind. I, 688. A tree 50 to 60 feet high: young branches cinereous-puberulous, soon becoming glabrous. Leaves 6 to 12 in. long: leaflets 6 to 10, corraceous, narrowly oblong or lanceolate-oblong, shortly and bluntly acuminate, entire, the base cuneate or rounded; both surfaces quite glabrous and finely reticulate; main nerves 8 to 14 pairs, faint, spreading; length 2 to 5.5 in., breadth .75 to 1.65 in., petiolules .15 to .25 in. Panicles axillary or terminal; the branches racemose, puberulous. Flowers rather crowded, pedicellate, '2 in. in diam. Calyx with 5 deep ovate segments with broad bases and acute apices, pubescent. Petals 5, narrowly lanceolate, hairy. Disc small, glabrous: Stamens about 8, exserted, the anthers short and broad, the filaments pubescent. Ovary with 2 ovate lobes, villous, 2-celled; style stout, shortly divaricate at the apex. Fruit with usually only one narrowly-ellipsoid stoutly-echinate glabrous lobe 1.25 in. long and .5 in. in diam.: the spines short and hollow, compressed and glabrous. Radlk. Sapind. Holl.-Ind. 76. Euphoria Litchi, Wall. Cat. 8048 G. and H.

Malacea: Griffith, No. 996; Maingay, No. 452. Singapore: Wallich, Ridley, Nos. 5095, 6211. Perak: King's Collector, Nos. 6523, 6750.

4. NEPHELIUM LAPPACEUM, Linn. Mant. I, 125. A tree 30 to 60 feet high: young branches rusty-pubescent. Leaves 4 to 10 in. long: leaflets 4 to 6, elliptic, sub-obovate-elliptic or elliptic-oblong, sub-acute, entire, the base cuneate: both surfaces glabrous and minutely reticulate; main nerves 7 to 9 pairs, ascending, prominent beneath; length 2.5 to 6 in., breadth 1.25 to 3 in., petiolules .2 to .25 in. Panicles shorter than the leaves, tomentose, terminal and axillary, with numerous racemose branches. Flowers '1 in. in diam., in cymose fascicles on the branches. Sepals 4 to 6, sub-valvate. Petals 0. Stamens 5 to 8, exserted, the filaments pubescent. Ovary 2-3-lobed and 2-3-celled, pubescent and echinate. Style stout, deeply 2-3-lobed; the lobes divergent, recurved. Fruit usually with 1 or 2 lobes, each elliptic and densely covered with long sub-compressed recurved soft puberulous setae with broad bases, yellowish-orange to dark purple when ripe, 1 in. long, and .75 in. in diam. (excluding the setae); aril of the seed pale, fleshy, edible. Gærtn. Fruct. II, 272, t. 140, f. 1; Blume Rumph. III, 103: Lamk. Ill. t. 764; Hassk. Pl. Jav. Rar. 287; Miq. Fl. Ind. Bat. I, pt. 2, p. 554; Hiern in Hook. fil. Fl. Br. Ind. I, 687. Euphoria Nephelium, DC. Prodr. I, 612; Bl. Bijdr. 235; Wall, Cat. 8053 (excl. part of B). Scytalia Ramboutan, Roxb. Hort. Beng. 29; Fl. Ind. II, 271. Dimocarpus crinita, Lour. Fl. Cochinch, 234. N. echinatum, Noronh. in Batav. Genootsh. Verh. V. 80.

In all the Provinces except the Nicobars and Andamans: often cultivated for its fruit which is known as the Ram Boutan.

5. NEPHELIUM COSTATUM, Hiern in Hook. fil. Fl. Br. Ind. I. 688. A tree 50 to 60 feet high: young brauches puberulous, slightly lenticellate. Leaves 6 to 12 in. long, equally pinnate: leaflets 4 to 10, coriaceous, oblong-lanceolate to elliptic, the apex sub-acute or shortly and bluntly acuminate, the base slightly narrowed but rounded, upper surface glabrous, the lower minutely puberulous near the nerves but becoming glabrescent, sub-glaucous; main nerves 10 to 18 pairs, spreading, prominent beneath: length 2.75 to 5.5 in., breadth 1.25 to 1.75 in., petiolules .25 in. Panicles usually 3 or 4 together, mostly axillary, 4 to 6 in. long, puberulous, the branches short, racemose. Flowers 2 in. in diam., pedicelled, in short cymules. Sepals 5, subrotund, thick, minutely tomentose outside and pubescent inside. Petals 5, much smaller than the sepals, spathulate, villous. Disc large, flat, glabrous. Stamens 8 to 12, exserted, the filaments hairy at the base, the anthers glabrous. Ovary broadly ovate, 2-lobed, covered with course villi; style short, stout, simple. Fruit of two or usually of only one sub-globular lobe densely covered with long stout curved puberulous blunt setae, diam. (when not quite ripe and to the ends of the setae) ·75 in. Radlkofer Sapind. Holl.-Ind. 76.

Malacca, Maingay, No. 454. Perak: Scortechini, Nos. 30, 1992.

6. NEPHELIUM CHRYSEUM, Blume Rumphia, III, 105. A tree 30 to 50 feet high: young branches puberulous or glabrescent. Leaves 6 to 12 in. long; their rachises slender, cinereous-puberulous: leaflets 4 to 8, sub-coriaceous, oblong to elliptic-oblong, shortly and often rather bluntly acuminate; the base much narrowed and sometimes oblique: upper surface glabrous and shining, the lower sub-glaucous and sparsely puberulous; main nerves 9 to 13 pairs, spreading and curving: length 2.5 to 5 in., breadth 1.25 to 1.75 in., petiolules .15 in. Panicles axillary, solitary or several together, 3 to 4 in. long, with few raceme-like branches; the flowers shortly pedicelled and in small clusters, 15 in. in diam. Calyx deeply cut into 5 or 6 broadly-oblong blunt teeth, minutely tomentose. Petals 0. Stamens 7 or 8, exserted or not: the anthers broadly ovate, sparsely pubescent; the filaments short, pubescent. Disc sub-glabrous, sulcate. Ovary compressed, reniform, bilobed, rusty-pubescent; the style stout, pubescent, longer than the ovary, bifid at the apex, the lobes recurved. Fruit usually 1-lobed, sub-globose, densely covered with conical compressed striate woody spines, diam. to the tips of the spines about 2 in.: seed with a large succulent aril. Mig. Fl. Ind. Bat. Vol. I, pt. 2, p. 554. Euphoria chrysea Korth. MSS.

Perak: King's Collector, Scortechini. Selangor; Ridley No. 407.

Singapore: Ridley, Nos. 6358, 6374.—DISTRIB. Borneo.

7. NEPHELIUM HAMULATUM, Radlk. üb. Sapind. Holl.-Ind. 78. A tree; young branches rusty-puberulous. Leaves 10 to 15 in. long, their rachises rusty-puberulous: leaflets 6 to 10, oblong, shortly acuminate. rarely acute, the base cuneate; upper surface minutely reticulate and glabrous except the puberulous midrib; the lower sub-glaucous, covered with very minute pale pubescence, the 16 to 24 pairs of spreading nerves rusty-pubescent and very prominent; length 2.5 to 4.5 in., breadth 1 to 1.75 in., petiolules 15 in. Panicles terminal or axillary, 4 to 6 in. long; the branches few, slender and raceme-like, densely tomentose. Flowers 1 in. in diam., numerous, in small cymules, on pedicels a little longer than themselves. Calyx tomentose outside, deeply divided into 4 broad rather unequal blunt segments. Petals 0. Stamens 6 or 7, exserted. the anthers broadly-ovate and sub-glabrous, the filaments long and pubescent, Ovary 2-lobed, rusty-villous. Fruit with only a single lobe developed, ovoid, densely covered with stout rusty-puberulous woody spines with broad slightly compressed sub-glabrous bulbous bases, nearly 1.5 in. long to the tips of the spines, and 1 in. or more in diam.

Malacca: Maingay, No. 450; Derry, Nos. 1094, 1304, 1882.

8. NEPHELIUM OPHIODES, Radlk. Sapind. Holl.-Ind. 78. A tree 50 to 80 feet high: young branches rusty puberulous. Leaves 12 to 18 in. long, their rachises 3-angled; leaflets 6 to 10, very coriaceous, oblong, rarely elliptic-oblong, very shortly and bluntly acuminate, the base slightly narrowed and oblique; upper surface glabrous, the lower minutely scaly and rusty-puberulous; main nerves 15 to 18 pairs. spreading and curving upwards, slightly depressed on the upper bold and prominent on the lower surface; length 6 to 8 in., breadth 2 to 2.5 in., petiolules 2 to 25 in. Panicles axillary or terminal, sometimes pedunculate, 8 to 16 in. long, much branched, rusty-tomentose. Flowers 15 in. in diam., shortly pedicelled. Calyx tomentose, deeply divided into 5 or 6 broadly triangular acute lobes. Petals 0. Disc glabrous. Stamens 6 to 8, slightly if at all exserted: filaments subulate, pubescent; anthers short and puberulous. Ovary abortive on one side, broadly ovoid, densely setose-pubescent, 1-celled, Fruit with only one lobe developed, oblong-ovoid, densely covered with long flexuose puberulous setae, 1.5 in. long and 1 in. in diam. N. eriopetatum, Hiern in Hook. fil. Fl. Br. Ind. I, 689 (in part).

Malacca: Maingay, No. 453. Perak: King's Collector, Nos. 5481, 7140.

9. NEPHELIUM ERIOPETALUM, Miq. in Fl. Ind. Bat. Suppl. 508. A large tree: the young parts, the rachises of the leaves, the under surfaces of the leaflets and the inflorescence minutely rusty- or fulvous-tomentose or pubescent. Leaves 12 to 24 in. long: leaflets 6 to 10, thickly coriaceous, oblong, rarely obovate-oblong, sub-acute, slightly narrowed to the rounded or cuneate base: upper surface glabrous and shining except the tomentose midrib; the lower brown, tomentose or pubescent, with the 16 to 24 pairs of spreading main nerves and the transverse reticulations prominent; length 4 to 12 in., breadth 1.65 to 4 in., petiolules ·25 to ·35 in., tomentose, stout. Rucemes in small clusters in the leafaxils, pendent, 4 to 10 in. long (longer in fruit); the flowers in glomeruli, shortly pedicelled, 25 in. in diam. Calyx with 5 deep triangular sub-acute spreading teeth, pubescent externally, glabrescent internally. Petals 5 or fewer, oblong and blunt, or subspathulate, much narrower than the calyx-teeth, pubescent. Disc lobulate, pubescent. Stumens about 10, not exserted, anther oblong, filament short, both sparsely pubescent. Ovary slightly compressed, 2-lobed, rusty-setose: styles 2, longer than the ovary, pubescent; divaricating, recurved. Fruit ovoid, densely covered with flexuose compressed puberulous soft spines, about 2 in, long (measured to the ends of the spines) and about 1.5 in, in diam. Hiern in Hook. fil. Fl. Br. Ind. I, 689.

Malacca: Maingay, No. 448. Singapore: Ridley, Nos. 4584, 6022. Perak: Scortechini, No. 143: Wray, No. 1300.—DISTRIB. Sumatra.

10. NEPHELIUM MALAIENSE, Griff, Notul. IV, 549, A tree; young branches with much scurfy tawny minute pubescence and elongated lenticels in rows. Leaves 10 to 14 in. long, their rachises angled and covered with minute tawny scurfy tomentum; leaflets 6 to 8, subopposite, thinly coriaceous, usually elliptic, sometimes elliptic-oblong, shortly cuspidate, very slightly narrowed to the rounded slightly oblique base; upper surface glabrous, the lower with small hairs on the nerves and prominent reticulations; main nerves 15 to 18 pairs, spreading; length 3.5 to 5 in., breadth 2 to 2.5 in.; petiolules 15 in., tomentose. Panicles terminal, minutely rusty-glandular-tomentose, 6 to 9 in. long, branches rather numerous. Flowers in fascicles on the raceme-like branches, shortly pedicelled, 25 in. in diam. Calyx pubescent, with 5 deep ovate-rotund obtuse lobes. Petals 5, about as long as the calyxlobes but narrower, obovate, villous inside. Stamens 8, short, scarcely exserted; anthers glabrous, shorter than the filaments. Ovary 2-lobed, rusty-setose, the style about as long as the ovary; the stigma capitate, Fruit (fide Hiern) slightly tubercled or almost smooth, globose, '65 to '75 in. in diam. Seed globular, its arillus fleshy.

Malacca: Griffith, No. 999; Maingay, No. 455,

I have not seen the fruit of this, and the description above given is copied from Hiern.

Doubtful species.

11. Nephelium sufferugineum, Radlk. üb. Sapind. Holland.-Ind. 77. A tree: young branches minutely rusty-tomentose. Leaves 6 to 8 in. long, the rachises puberulous: leaflets 2 pairs, thinly coriaceous, elliptic or obovate-elliptic, sub-acute, the base cuneate; upper surface glabrous and minutely reticulate, the lower minutely densely adpressed-puberulous; main nerves 9 to 11 pairs, ascending, rather straight, prominent on the lower surface; length 2.75 to 4 in., breadth 1.75 to 2.25 in., petiolules 2 in. Panicles about as long as or shorter than the leaves, crowded, axillary, rusty-pubescent, their branches racemose. Flowers 2 in, in diam., shortly pedicelled. Calyx rusty-tomentose, deeply cut into 5 broadly ovate sub-acute lobes. Petals 0. Disc glabrous. Stamens about 8, the anthers glabrous, the filaments subulate and hairy. Ovary not lobed, sub-globular, rusty-pubescent, much shorter than the simple sub-glabrous style.

Malacca: Griffith, No. 1000.

I have not seen fruit of this; but Radlkofer describes it as follows;
—"fructus aculeis brevioribus e basi obconica filiformibus hamatocurvatis glabris laxius muricatis." The fruit thus attributed to the
species is however not attached to the branches in Griffith's specimens,

which are the only ones known. It is therefore doubtful whether they really belong to the former which, but for the pubescence on the under surface of the leaves, might belong to N. glabrum, Noronha.

POMETIA, J. R. & G. Forst.

Tall trees. Leaves alternate, pinnate; leaflets subopposite, entire or serrate (the lowest pair usually stipuliform). Racemes simple or panicled, elongated, slender. Flowers regular, polygamous, fascicled, small, shorter than their pedicels. Calyx cup-shaped, 5-4-fid, valvate Petals 5-4, small, usually without scales. Disc complete, annular, lobed. Stamens 4-8, usually 6-4, inserted within the disc, at length much exserted; anthers small. Ovary 2-3-coccous and -celled; Style elongated; stigma obtuse, emarginate. ovules solitary. 1-2-coccous; lobes subglobose or ellipsoidal, indehiscent, smooth. Seeds exalbuminous, covered with a mucilaginous aril.—DISTRIB. Species about 4, in Malaya Ceylon and Australasia.

Calyx and leaflets quite glabrous, panicles sub-1. P. macrocarpa. Calyx always pubescent, leaflets glabrous or pubescent; inflorescence puberulous or pubes-

... 2. P. pinnata. Leaves 12 to 24 in. long

Leaves 3 to 8 in. long

Leaflets oblanceolate, caudate-acuminate; petals oblong, much longer than the calyx; panicles much longer than the leaves ... Leaflets oblong or oblong-oblanceolate, not caudate-acuminate; petals often absent, if present rotund and not much exceeding the calyx; panicles not longer than the leaves 4. P. alnifolia.

3. P. gracilis.

1. Pometia Macrocarpa, Kurz in Journ. As. Soc. Bengal, Vol. XLIV, pt. II, (1875), p. 205. A glabrous tree; leaves 9 to 12 in. long, the rachises glabrous and the petioles thickened at the base: leaflets coriaceous, oblong or elliptic-oblong, slightly unequal-sided, shortly acuminate, the edges with remote glandular teeth, the base rounded; both surfaces quite glabrous, the lower paler and with the reticulations distinct, the midrib prominent on both; main nerves 15 to 18 pairs, spreading, depressed on the upper, prominent on the lower surface; length 4.5 to 6 in., breadth 1.75 to 2 in; petiolules .2 in., stout. Panicles axillary, about as long as the leaves, with several sub-glabrous racemoid branches bearing the flowers in cymules. Flowers 1 in. in diam., on glabrous pedicels twice as long as themselves. Calyx glabrous, 5-lobed. Petal

0. Stamens 5; anthers broadly ovate, glabrous; filaments pubescent and thickened towards the base. Ovary sparsely pubescent, 2-lobed. Fruit ovoid, glabrous, 1.5 to 2 in. long; the pericarp thick, spongy inside. Seed single with a short arillus. Radlk. üb. Sapind. Holl.-Ind. No. 82.

Malacca: Maingay, No. 463.

A species known only by Maingay's scanty and imperfect specimens.

2. POMETIA PINNATA, Forst. Char. Gen. 110. A tree 30 to 50 feet high; young branches puberulous or glabrescent. Leaves 12 to 36 in. long, equally pinnate, the rachises angled, the petioles swollen at the base, glabrous or glabrescent; leaflets 4 to 12 pairs, sub-opposite, thinly coriaceous, oblong or oblanceolate-oblong, acute or shortly acuminate, the edges coarsely and remotely serrate, the base rounded sub-cordate or cuneate; the lower leaflets smaller than the upper: the lowest very small, sub-rotund, and sometimes less than 1 in. long: the upper varying in length from 4 to 12 in. and in breadth from 1.75 to 4 in.; petiolules 15 in., stout: both surfaces glabrous or puberulous, often pubescent on the midrib and nerves, the reticulations minute: main nerves numerous, parallel, prominent beneath. Panicles axillary or terminal, spreading, puberulous, shorter than the leaves, their branches spreading and often with auricled bracts at their bases. Flowers numerous, pedicellate, '1 in. in diam., polygamous. pubescent, deeply divided into 4 or 5 triangular teeth. Petals 4 or 5, small, glabrous or slightly pubescent, without a basal scale. Disc fleshy, lobed, glabrous. Stamens 5 or 6, the anthers glabrous, the filaments subulate and puberulous. Ovary obcordate, bilobed: style longer than the ovary, bifid at the apex. Fruit usually reduced to a single lobe, ellipsoid, blunt, glabrous, 1-seeded, variable in size; length from '75 to 1.25 in, ; diam. from '5 to '8 in. P. tomentosa, Kurz Andaman Report, ed. 2, p. 34; For. Flora Burma, I, 295; Hiern in Hook. fil. Fl. Br. Ind. I, 691. Irina glabra, Blume Bijdr. 230; Rumphia, III, 113; Hassk. Pl. Jav. Rar. 284; Miq. Fl. Ind. Bat. I, pt. 2, 558. Irina diplocardia, Blume Rumphia, III, 115. Pometia eximia, Bedd. Fl. Sylv. t. 157. Eccrementhus eximius, Thwaites in Hook. Kew Journ. VII, 272, t. 9. Nephelium eximium, Thwaites Enum. 57 .-Rumph. Herb. Amboin. III, 31, t. 17.

Malacca: Maingay, No. 459. Perak: very common; King's Collector.—Distrib. Ceylon.

3. Pometia gracilis, King n. sp. A tree 40 to 50 feet high; the branches slender, drooping, the youngest cinereous-puberulous, minutely lenticellate. Leaves 5 to 8 in. long, their rachises minutely rusty-pubescent; leaflets 5 to 8, opposite, membranous, the upper ones the

largest and oblanceolate, the lower often oblong, all caudate-acuminate. the edges with small remote glandular teeth; the base much narrowed in the upper leaflets oblique and rather rounded in the lower: upper surface reticulate, shining, glabrous except the pubescent midrib, the lower reticulate and glabrous but pubescent on the midrib and nerves; length 3 to 6 in., breadth 1 to 1.6 in.; petiolules 1 in. or less, pubescent. Panicles much longer than the leaves, axillary or terminal, slender, with a few raceme-like branches bearing the flowers in small uniparous lateral cymules. Flowers :05 in. in diam. Calyx campanulate, deeply divided into 5 ovate sub-acute pubescent teeth. 5, longer than the calyx, oblong, truncate, pubescent inside. Stamens 5, exserted, the anthers broadly ovate, glabrous: filaments long, pubescent and thickened at the base. Disc cupular, fleshy, glabrous. Ovary bilobed, rusty-pubescent; style short, glabrous. Fruit with 2 or more often with 1 ellipsoid glabrous shining lobe, '75 in. long and '5 in. in diam.

Perak: King's Collectors, Nos. 3479, 3607, 3781, 4514, 7255; Wray, No. 2912. Singapore: Ridley, No. 6373.

This differs from *P. alnifolia* in having its leaflets caudate-acuminate at the apex and much more narrowed at the base, and in the midribs and nerves on the lower surface being pubescent as well as the midrib on the upper. The panicles are besides very much longer, and the flowers have longer pedicels than in *P. alnifolia*; while the petals, which seem to be always present, much exceed the calyx-lobes.

4. POMETIA ALNIFOLIA, Radik. über Sapind. Holl.-Ind. 30. A tree 50 to 70 feet high: young branches pubescent, reddish when young. Leaves 3 to 8 in. long, equally or unequally pinnate, the rachises slender and pubescent, the petiole not swollen at the base but often with a minute stipule-like leaflet. Leaflets 6 to 9, opposite or alternate, oblong or oblanceolate-oblong, sub-coriaceous, shortly acuminate, the edges with remote minute glandular teeth, slightly narrowed to the rounded or cuneate base; upper surface glabrous, shining; the lower pale and with a few scattered hairs; main nerves spreading, numerous, parallel, prominent below, length of the upper leaflets 3 or 4 in,, breadth '9 to 1.25 in., the lower leaflets smaller and the lowest of all Panicles terminal, axillary, minutely tomentose, about as long as the leaves, with a few racemoid branches bearing the flowers in lateral cymules. Flowers less than 'l in. in diam.; bracts linear, pubescent, pedicels short. Calyx with 5 deep valvate puberulous triangular segments. Petals 5, usually shorter than the calyx, sub-rotund, villous at the apex inside, or absent. Stumens 5, slightly exserted, the anthers short, the filaments glabrous. Disc cupular, fleshy, glabrous,

Ovary obcordate, 2-lobed, pubescent, style glabrons. Fruit usually with only one properly developed lobe (the other sub-aborted) oval and blunt, or sub-globose, glabrous, 1 in. long and 5 in. in diam.; when globular 5 to 6 in. in diam. Irina alnifolia, Blume Rumphia III, 117.

Perak: King's Collector, Nos. 3790, 6949, 7774, 7983, 8212; Scortechini, No. 113; Wray, No. 1336. Singapore: Ridley, 6372. Penang: Curtis, No. 1600.

A species with much smaller leaves leaflets and inflorescence than *P. pinnata*, Forst. Miquel (Fl. Ind. Bat. Vol. I, pt. 2, 558) reduces it to *T. tomentosa*, Bl. which is in my opinion doubtfully distinct from *T. glabra*, Blume. But *P. alnijolia* appears to me a perfectly good distinct species recognisable at a glance from every form of *P. pinnata*, Forst.

Besides the preceding there are in the Herbarium Calcutta two species of *Pometia* which, for want of complete material, I do not describe. One of these is from Penang (Curtis, No. 1668). It has entire leaflets somewhat like those of *P. alnifolia* and globular fruit. *Flowers* are quite wanting. For it I propose the name *P. Curtisii* The other is from Negri Sembilan, communicated by Mr. H. N. Ridley. It also has leaflets somewhat like those of *P. alnifolia*, but broader and with entire undulate edges. The inflorescence and flowers are quite glabrous. Fruit is wanting. To this I have given the MSS. name *P. Ridleyi*.

11. GUIOA, Cav.

Erect shrubs or trees. Leaves alternate, exstipulate; leaflets 1 to 6 (rarely 10) pairs; more or less lanceolate, oblique, entire, often coriaceous. Flowers in simple or branched racemes, axillary or from the axils of fallen leaves, sub-globose in bud. Sepals 5, ovate-rotund, thick, concave, imbricate in 2 rows, pubescent at the edges. Petals 5, each with 2 pectinate scales. Disc entire, annular, or semilunar, or crescentic. Stamens 8. Ovary 3-angled, with a single curved style and 3-lobed stigma. Fruit sessile or pedicelled, obliquely obcordate, boldly 3-winged, glabrous, the interior of the pericarp cartilaginous. Seeds wholly or partly enveloped in a thin arillus with 2 flexuose appendages. Cotyledons fleshy and oily, the inner obliquely conduplicate; the radicle inferior.—Distrib. About 33 species Malayau and Australian.

Rachises of the leaves narrowly winged ... 1. G. pleuropteris. Rachises of the leaves terete

Leaflets glabrous on both surfaces ... 2. G. squamosa. Leaflets sparsely pubcscent on the upper, pubescent on the lower surface... ... 3. G. fuscidula.

Leaflets densely tomentose on the lower surface ... 4. G. pubescens.

1. Guioa pleuropteris, Radlk. in Sitzb. Bayer. Akad. Math. Phys. IX (1839), p. 611. A shrub or sometimes a tree: young branches minutely rusty-pubescent. Leaves 4 to 7 in. long, their rachises narrowly winged and puberulous, usually unequally pinnate: leaflets 3 to 7, ovate-lanceolate or ovate-oblanceolate, acute or broadly and shortly cuspidate, the base cuneate: upper surface with short scattered hairs; the lower pale, minutely punctate and more pubescent than the upper: main nerves about 5 pairs, rather distinct beneath: length 2.5 to 4.5 in., breadth 1 to 1.75 in., petiolules 1 in. Racemes branched, 2 to 4 in. long. Fruit .75 in. broad, the wings narrow, contracted below into a short pseudostalk, pedicel 3 in. long. Cupania pleuropteris, Blume Rumphia III, 158; Miq. Fl. Ind. Bat. Vol. I, pt. 2, 564; C. pleuropteris var. apiculata, Hiern in Hook. fil. Fl. Br. Ind. I, 677. Cupania Grijithiana, Kurz in Journ. As. Soc. Beng. Vol. XLIV, pt. 2, (1875), p. 188, in part; For. Flora Burma, I, 284.

Malacca: Maingay, No. 442. Johore: Ridley, No. 4064. Pahang: Ridley. Perak: King's Collector, Nos. 311, 1136.—DISTRIB. Sumatra Rieu, Borneo.

Var. bijuga. Leaflets 2 pairs, the rachis slightly dilated towards the apex. G. bijuga, Radlk. l. c. 611. Cupania pleuropteris, var. bijuga, Hiern in Hook. fil. Fl. Br. Ind. I, 677. C. (indeterminata) Wall. Cat. 8094. C. Griffithiana, Kurz in Journ. As. Soc. Beng. XLIV, pt. 2, (1875), p. 188.

Malacca: Griffith, No. 984. Maingay, No. 437.

2. Guioa squamosa, Radlk. in Sitzb. Bayer. Akad. Math. Phys. IX (1879), p. 609. A slender tree from 20 to 30 feet high; young branches rusty-puberulous, dark-coloured when dry. Leaves 6 to 10 in. long, sometimes foveolate or punctate beneath; leaflets 4 to 8 pairs, lanceolate to ovate-lanceolate, shortly and bluntly acuminate, sub-falcate, the base narrowed and oblique; both surfaces glabrous; main nerves 8 to 10 pairs, rather distinct beneath, curving, the secondary nerves and reticulations distinct. Panicles raceme-like, 2 or 3 in. long, almost glabrous. Fruit 1 in. across, the wings broad, subundulate, suddenly narrowed to a short stout pseudo-stalk; the style persistent, broad at the base; pedicel '25 in. long. Cupania regularis, Knrz (not of Blume) Journ. As. Soc. Bengal, Vol. XLIV, pt. 11 (1875), 188. Cupania glabrata, Hiern (not of Kurz), Hook. fil. Fl. Br. Ind. I, 676. Sapindus squamosus, Wall. (not of Roxb.) and Cat. No. 8097; "Connaracea?" Wall. Cat. 8550.

Penang: Wallich, King's Collector, No. 1516. Singapore: Ridley, No. 6209a. Malacca: Griffith.—D:STRIB. Java; Burma, Helfer, No. 983.

3. Guioa fuscidula, Radlk, in Sitzb. Bayer. Akad. Math. Phys. IX (1879), p. 609. A tree 30 to 40 feet high: young branches puberulous, dark-coloured. Leaves 4 to 12 in. long; leaflets usually equally pinnate (3 to 4 pairs), elliptic, oblique, sub-acute, slightly narrowed at the base: the upper surface sparsely puberulous, the midrib pubescent; the lower pubescent, becoming glabrescent when old: main nerves 6 or 7 pairs, distinct beneath as are the reticulations; length 2 to 3 in., breadth 1 to 1.5 in., petiolules 2 in. Racemes about 2 in. long, pubescent. Scales of petals woolly. Fruit about 5 in. broad, narrowed to a long pseudo-stalk, pedicel 25 in. long. Cupania fuscidula, Kurz in Journ. As. Soc. Bengal, for 1872, p. 302; For. Flora Burma, I, 284; Hiern in Hook. fil. Fl. Br. Ind. I. 677.

Perak: King's Collector, Nos. 2452, 3818. Burmah (Tenasserim): Helfer, No. 993.

Var. glabrescens, Leaflets, except the midrib, almost glabrous.

Perak: Scortechini, No. 1714.

4. Guioa pubescens, Radlk. in Sitzb. Bayer. Akad. Math. Phys. IX (1879), p. 612. A small tree; young shoots tawny-puberulous. Leaves 6 to 9 in. long, usually equally pinnate, their rachises terete and puberulous; leaflets 4 to 5 pairs, alternate, narrowly oblong-lanceolate, falcate, acuminate, the bases much narrowed and oblique; upper surface with a few minute adpressed scattered hairs, the lower densely covered with minute tawny tomentum; main nerves 5 to 7 pairs, faint, curving; length 2 to 3 in., breadth '65 to 1 l in., petiolules '15 in. Panicles racemose, about 3 in. long, puberulous. Fruit '6 in. broad, the wings narrow, pseudo-stalk shorter than the pedicel, pedicel '25 in. Cupania pallidula, Hiern in Hook. fil. Fl. Br. Ind. I, 676. C. Griffithiana, Kurz in Journ. As. Soc. Beng. XLIV, pt. 2 (1875), p. 188; For. Flora Burma, I, 284 (in part).

Malacca: Griffith, No. 982; Maingay, No. 436. Singapore: Hullett, Bidley, No. 1912.—DISTRIB. Java, Sumatra, Bangka.

12. TRIGONACHRAS, Radlk.

Trees with pinnate 5- to 10-jugate narrowly lanceolate somewhat falcate entire eglandular leaflets. Panicles racemose, terminal or axillary. Calyx small, cupular, with 5 spreading imbricate segments. Petals 5, each with 2 pectinate scales. Disc entire, swollen, annular. Stamens 8. Fruit large, clavate-pyriform, the pericarp thick, crustaceous, bluntly 3-angled, minutely tomentose, 3-celled, usually (by abortion) only 1-seeded. Seed pyriform-ovoid, exarillate.

TRIGONACHRAS ACUTA, Radlk. in Sitzb. Bayer. Akad. Math. Phys. IX (1879), p. 672. A tree; young shoots rusty-pubcrulous. Leaves 8 to 12 J. II. 57

in. long; their rachises terete, glabrous; leaflets 11 to 15, narrowly oblong-lanceolate, shining on both surfaces: main nerves 8 to 10 pairs, faint, spreading; length 2 to 3.5 in., breadth .6 to .8 in., petiolules .2 in. Racemes paniculate, erect, terminal or axillary, tawny-tomentose, the flowers on long tomentose bracteolate pedicels. Calyx tomentose externally. Stamens long-exserted, the filaments hairy. Fruit apiculate, nearly 2 in. long and 1.2 in. in diam. Cupania acuta, Hiern in Hook. fil. Fl. Br. Ind. I, 676. Sapindacea, Wall. Cat. 9036.

Singapore: Wallich, Hullett; Ridley, No. 4648. Pahang: Ridley. Malacca: Maingay, No. 445.

13. ARYTERA, Blume.

Shrubs or trees with pinnate 1-5-jugate leaves: the leaflets elliptic or lanceolate, entire, sometimes foveolate in the nerve-axils underneath. Panicles axillary or terminal. Calyx small, cupular; the sepals 5, imbricate. Petals 5, each with 2 pectinate basal scales. Disc entire, annular. Stamens 8. Fruit 2- to 3-celled, shortly stipitate, lobed; the lobes elliptic, obcordate or obovate, always divaricate: the pericarp fleshy outside, sclerenchymatous inside. Seed entirely or almost entirely enveloped in an inappendiculate arillus; cotyledons thick, fleshy, superposed, radicle short.—Distrib. Malayan Archipelago and Peninsula, S. China and Australasia; about twenty species.

ARYTERA LITTORALIS, Blume Rumphia, III, 170. A tree 25 to 30 feet high: young branches rusty-puberulous. Leaves abruptly pinnate, 6 to 13 in. long, their rachises rusty-puberulous becoming glabrescent, not winged; leaflets 2 or 3 pairs, elliptic to elliptic-oblong, sub-acuminate, the base cuneate, both surfaces glabrous; main nerves 8 to 10 pairs, slightly prominent beneath, ascending, curved; length 3 to 6 in., breadth 1.5 to 3 in.; petiolules '25 in., stout. Panicles axillary, short, manybranched, rusty-puberulous. Flowers minute. Calyx with 5 short teeth, pubescent outside. Petals 5, slightly longer than the calvx, broadly cuneate, obliquely emarginate or bifid at the apex, pubescent on the upper surface. Anthers puberulous, filaments hairy. Fruit coriaceous, glabrous, 2-lobed; the lobes usually compressed, oblong, blunt, one of them often smaller than the other. Radlkofer in Sitzb. Bayer, Akad. Math. Phys. IX, (1875), p. 552. Cupania adenophylla, Planch. ex Hiern in Hook. fil. Fl. Br. Ind. I, 677; Kurz For. Flora Burma, I, 285. Sapindus adenophyllus, Wall. Cat. 8044.

Malacca: Griffith, Maingay, No. 439. Andamans: King's Collectors. Nicobars: Jelinek. Pahang: Ridley, No. 2162.—DISTRIB. Burma: Helfer, 989; Griffith, 988. Sumatra: Forbes, No. 2624.

Var. major. A tree 30 to 70 feet high; leaflets with 12 to 14 pairs of nerves: lobes of fruit oblong, only slightly compressed.

Perak: King's Collector, Nos. 695, 885, 4456; Scortechini, No. 20; Wray, No. 316. Singapore: Ridley, No. 5995. Selangor: Ridley, No. 1609.

14. MISCHOCARPUS, Bl.

Trees with alternate exstipulate unequally pinnate leaves: leaflets 1 to 5 pairs, ovate-lanceolate or elliptic, entire, usually glabrous. Racemes axillary, simple or branched. Calyx small, cup-shaped, 5-partite, the segments imbricate. Petals 5, each with 2 large pectinate scales, or absent. Disc entire, annular. Stamens 8 or fewer. Fruit pyriform, blunt, 3-angled or 3-grooved, or smooth, pedicelled, rarely sessile, 3-celled; the pericarp thin, fleshy, sclerenchymatous inside. Seeds more or less completely enveloped in a thin arillus with 2 spurlike processes near its base. Cotyledons lying above each other, radicle short.—Distrib. About a dozen species, Malayan and Australasian.

Petals 5, minute, caducous ... 1. M. fuscescens. Petals 0.

Fruit truncately pyriform, boldly 3-angled ... 2. M. sundiacus.
Fruit pyriform, not truncate, not angled ... 3. M. sunatranus.

1. Mischocarpus fuscescens, Blume Rumphia III, 166. A tree 50 to 70 feet high: all parts except the inflorescence glabrous. Leaves 9 to 12 in. long, equally or unequally pinnate; leaflets 4 to 6, ellipticoblong or oblong-lanceolate, sub-acuminate, cuncate at the base, both surfaces shining and finely reticulate, foveolate in the axils beneath; main nerves 12 to 15 pairs, slightly conspicuous beneath, curving: length 4 to 8 in., breadth 1.5 to 2 in.; petiolules '25 in., stout. Panicles axillary or terminal, erect, puberulous; the branches few, racemose with the flowers in small cymes. Calyx sub-valvate. Petals 5, minute. Stamens 8. Disc hairy. Ovary pyriform, entire, stipitate. Fruit obovoid, with a faint vertical ridge, glabrous, '4 in. long, its pseudo-stalk '25 in. long. Radlk. l. c. 646. Cupania fuscescens, Miq. Fl. Ind. Bat. Vol. I, pt. 2, 567; C. Helferi, Hiern in Hook. fil. Fl. Br. Ind. I, 679.

Selangor: Ridley, No. 1916. Perak: King's Collector, No. 2689; Scortechini.—Distrib. British India: Sylhet, Wall. Cat. 8018, 9035. Burma: Griffith, 987; Helfer, 982/1.

2. Mischocards sundiacus, Blume Bijdr. 238; Rumphia III, 167. A tree 25 to 50 feet high; young branches slightly puberulous or glabrous. Leaves 6 to 10 in. long, equally or unequally pinnate; leaflets 3 to 6, elliptic-oblong or oblong-lanceolate, sub-acuminate, cuneate and sometimes slightly oblique, at the base: both surfaces glabrous, shining and very minutely reticulate; the lower paler, foveolate in the axils of the 8 to 10 pairs of faint ascending curving main nerves: length 2.5 to

6 in., breadth 1.5 to 2 in., petiolules '15. Panicles of a few racemose branches on which the flowers are arranged as shortly stalked cymes, slightly puberulous. Fruit '25 in. in diam. truncately pyriform, boldly 3-angled, crowned by the short style and narrowed at the base into a thin pseudo-stalk longer than itself, pedicel '15 in. long. Cupania Lessertiana, Camb. Mèm. Mus. XVIII, 46 t. 3; Hasskarl Pl. Jav. Rar. 285; Miq. Fl. Ind. Bat. Vol. I, pt. 2, 566; Hiern in Hook. fil. Fl. Br. Ind. I, 678; Radlk l. c. 646. Molinaea? Wall. Cat. 8092.

Singapore: Wallich. Malacca: Maingay, No. 438; Ridley, No. 1908. Perak: King's Collector, Nos. 4186, 7265; Scortechini, Nos. 953, 1458. Andamans: King's Collector. Penang: Curtis, No. 2433.—DISTRIB. Burma (Helfer, No. 991); Assam, Khasia, Chittagong.

This species differs very little from M. fuscescens. It has, however, a less pubescent inflorescence, three petals are often present in the flowers and the fruit is sharply 3-angled. The young branches in this are puberulous whereas those of M. fuscescens are quite glabrous.

The fruit of this while young is sharply 3-angled; but as it ripens the angles become obliterated and it closely resembles that of *M. Sumatranus* and *M. fuscescens*. This species may, however, be distinguished from these by its smaller leaflets with fewer nerves.

3. MISCHOCARPUS SUMATRANUS, Blume, Rumphia III, 168. A tree 30 to 50 feet high: all parts except the inflorescence glabrous. Leaves 5 to 12 in. long, with angled rachises: leaflets 4 to 8, elliptic-oblong, sub-acuminate, the base cuneate, both surfaces minutely reticulate and shining; main nerves 9 to 12 pairs, curved, the secondary almost as prominent; length 4 to 8 in., breadth 1·15 to 2·25 in., petiolules ·2 tó ·25 in. Panicles as in M. fuscescens. Petals 0. Fruit pyriform, ·3 in. in diam., not angled, pseudo-stalk shorter than the fruit and also than the pedicel, pedicel ·2 in. Radlk. l. c. 646. Cupania sumatrana, Miq. Fl. Ind. Bat. Vol. 1, pt. II, 566; Hiern in Hook. fil. Fl. Br. Ind. I, 678.

Perak: Scortechini, Nos. 97, 484; King's Collector, Nos. 3933, 5278, 5391, 5397, 5727, 8307, 8329, 8374, 8403.

This is very closely allied to *M. fuscescens* which differs in having 5 minute caducous petals. In all other respects the two agree; and, in my own opinion they ought not both to rank as species. I keep both up however out of deference to Radlkofer whose monograph is a signal example of careful work.

15. LEPIDOPETALUM, Blume.

Small trees with 2- to 4-jugate pinnate leaves, the leaflets ovatelanceolate, entire. Racemes axillary, a few inches long, or thyrsiform. Sepals 4, united at the base, valvate. Petals 4, smaller than the sepals, each with one large scale connate to its margins. Stamens 8, the filaments glabrous. Ovary 2-celled, with a solitary ovule in each cell. Fruit capsular, coriaceous, obovate, compressed, 2-celled, reddish-brown when ripe, pericarp fleshy, the endocarp bright scarlet. Seed black with a mucilaginous coating and a basilar pink fleshy cupular arillus.—DISTRIB. 6 species from the Nicobars, Sumatra, Philippines and New Guinea.

Lepidopetalum Jackianum, Radlk. in Sitzb. Bayer. Acad. IX, 623. A small tree: young branches puberulous, soon becoming glabrous. Leaves 6 to 12 in. long; leaflets 2 to 10, sub-alternate, oblong or ovate-oblong, sub-acuminate, the base rounded or cuneate, both surfaces quite glabrous and finely reticulate; main nerves 7 or 8 pairs, bold beneath, spreading: length 3 to 5 in., breadth 1·15 to 2 in., petiolules ·15 in. Racemes under 2 in. long. Flower-buds oval, pointed; sepals lanceolate. Petals less than a third of the size of the sepals and alternate with them. Stamens short, inserted at the base of the ovary, filaments glabrous; anthers hirsute, oblong. Capsule not lobed, coriaceous, compressed, obovate, glabrous outside, hairy inside, minutely apiculate, 1·25 in. long and about ·8 in. broad, pedicel ·25 in. long. Seed solitary, black; arillus pale pink or white, viscous. Cupania Jackiana, Hiern in Hook. fil. Fl. Br. Ind. I, 678. Connarus? Jackianus, Wall. Cat. 8552. Prain in Proceed. As. Soc. Beng. 1891, p. 167.

Nicobar Islands; Jack, Kurz, Prain. Batti Malv, Prain.

Dr. Prain has given in the *Journal* above quoted an excellent account from the living plant of this previously little known species, and from his description mine is largely taken.

16. PARANEPHELIUM, Miquel.

Trees with alternate exstipulate unequally pinnate leaves: leaflets opposite or sub-opposite. Flowers panicled, regular, hermaphrodite (or polygamous?) 4-6-merous. Calyx deeply lobed, the lobes slightly imbricate. Petals usually 5, small, each bearing a single scutiform scale larger than itself (the two forming a pouch). Disc deeply excavated, entire. Stamens 6 to 10, the filaments subulate, glabrous; the anthers short, 2-celled, basifixed. Ovary 3-celled, obtusely 3-angled. Fruit a ligneous 3-valved capsule, externally tubercled, lobulate or spinose, imperfectly 3-celled, 1- to 3-seeded. Seed large, angled, partly covered by a thin arillus. Cotyledons fleshy, oily, conduplicate.—Distribe. Malaya and Burma, 3 or 4 species.

Leaflets entire, fruit lobulate 1. P. nitidum.

Leaflets serrate, fruit echinate ... 2. P. macrophyllum.

Hiern's genus Scyphopetalum (1875) is exactly the same as Para-

nephelium which dates from 1860. Miquel's genus Mildea (published in 1867), appears also to be reducible to this. The still older genus of Compositae bearing the name Paranephelius, Pocpp. et. Endl. dates from 1842: but it has been found to be reducible to Liabum, Adans.

1. Paramephelium nitidum, King n. sp. A tree 40 to 60 feet high: young branches slender, tercte, glabrous, lenticellate. Leaves 15 to 18 in. long, their rachises grooved: leaflets 5 to 9, coriaceous, oblong-lanceolate or oblong-oblanceolate, bluntly acuminate, entire, much narrowed to the base; both surfaces glabrous and shining; main nerves 14 to 16 pairs, curving, slightly prominent beneath; length 4.5 to 6.5 in., breadth 1.5 to 1.75 in., petiolules 25 in. Panicles axillary, 3 or 4 in. long, few-branched, very lax; the ultimate branchlets few-flowered, cymulose. Flowers 2 in. in diam., the style long-projecting, ovary rusty-pilose; stigmas 3, short, recurved. Fruit woody, depressed-globular, the surface deeply and irregularly lobulate, shortly apiculate, covered with brown scurf, 3-seeded; depth .75 in., breadth 1 in. (unripe).

Perak: King's Collector, Nos. 7410, 7416.

2. Paramephelium macrophyllum, King n. sp. A tree 20 to 40 feet high: all parts except the inflorescence glabrous. Leaves 18 to 30 in. long, the rachises terete; leaflets 5 to 9, sub-opposite, coriaceous, oblong, shortly and abruptly cuspidate, the edges with few remote serrations, cuneate at the base; main nerves 18 to 28 pairs, spreading, depressed on the upper and prominent on the lower surface; length 6 to 15 in., breadth 2.5 to 4.5 in.; petiolules 35 in., stout. Panicles pubescent, axillary, erect, few-branched, about 12 in. long, the ultimate branchlets cymose. Flowers 2 in. in diam. Stamens 8, inserted on the edge of the cupular glabrous lobulate disc. Ovary sub-globular, rustypilose. Fruit globular, woody, the whole surface covered with thick spines, 3-celled, 1-3-seeded; diam. to end of spines 1 to 1.5 in. (unripe).

Perak: Scortechini; King's Collector, Nos. 3157, 3204, 6436, 7027; Wray, No. 2675.

17. DODONÆA, Linu.

Shrubs rarely trees. Leaves simple (in the only Malayan species) alternate, exstipulate. Inflorescence lateral and terminal. Flowers polygamous, inconspicuous, Sepals 5-2, imbricated or valvate. Petals 0. Stamens 10-5, usually 8, inserted on the outer side of the dise; filaments short; anthers linear oblong. Disc obsolete in the male flower, small in the female. Ovary 3-6-sided and -celled; style 3-6-sided, its apex 3-6-cleft. Ovules 2 together, collateral or superposed. Capsule compressed, membranous, septicidally 2-valved; valves winged at the

back; cells 1-2-seeded. Seeds lenticular or subglobose, compressed, exalbuminous, exarillate, funicle thickened; embryo spirally involute.— DISTRIB. A genus of about 65 species mostly endemic in Australia.

DODONÆA VISCOSA, Jacq. Enum. Pl. Carib. 19. A shrub or small tree: the leaves simple, oblanceolate, sub-acute or very shortly apiculate, with sub-entire revolute margins, much narrowed to the base, both surfaces shining and sub-viscid; main nerves faint, numerous; length 1.75 to 4 in., breadth ·5 to 1·25 in., petiole ·1 in. Flowers ·25 in. in diam., in short few-flowered axillary spreading cymes. Sepals oblong, about 1 in, long as are the stamens. Capsule membranous, compressed, with a broad marginal wing notched at base and apex, about '75 in, long and slightly broader. Linn. Mant. 228; Hiern in Fl. Br. Ind. I, 697; Kurz For. Flora Burma I, 287; Baker in Oliv. Fl. Trop. Afr. I, 433; Benth. Fl. Austral. I, 475; Brand. For. Fl. 113: Boiss. Fl. Orient. I, 953. angustifolia, Linn. f. Suppl. Pl. 218; Roxb. Fl. Ind. II, 256. D. dioica, Roxb. Hort. Beng. 28; Fl. Ind. II, 256; Mig. Fl. Ind. Bat. Vol. I. pt. 2, p. 580. D. Burmanniana, DC. Prodr. I, 616; Wight Ill. I, t. 52; W. & A. Prodr. 114; Grah, Cat. Bomb. Pl. 30; Dalz. & Gibs. Bomb. Fl. 36; Thwaites Enum. 59; Miq. Fl. Ind. Bat. Vol. I, pt. 2, p. 580. D. microcarpa, DC. Prodr. I, 617. D. Wightiana, Blume Rumph. III, 189. D. pentandra, Griff. Notul. IV, 548. D. heterophylla, Hortul. ex G. Don. Gen. Syst. I, 674; Wall. Cat. 8081. Ptelea viscosa, Linn. Sp. Pl. ed. I, 118; Burm. Fl. Ind. 36. D. spathulata, Sm. in Rees Cycl. XII, n. 2. D. arabica, Hochst. & Steud. in Herb. Arab. Schimp. n. 766. -Burm, Fl. Zeyl, t. 23. Rumph, Herb. Amboin, IV, t. 50.

In all the provinces; but usually planted.—DISTRIB. Warm countries generally.

18. HARPULLIA, Roxb.

Erect trees. Leaves alternate, exstipulate, pinnate; leaflets alternate, entire, acuminate, sub-glabrous. Flowers diœcious or polygamous, in racemes or panicles, regular. Sepals 4-5, erect, equal, imbricated. Petals 4-5, narrowly obovate, exceeding the calyx, sometimes clawed, without either glands or scales, but sometimes with inflected lobes at the base of the lamina. Stamens 5-8, inserted within the obscure disc. Ovary pubescent, ellipsoidal or oblong, 2-celled; ovules usually 2 together, superposed. Style elongated; stigma linear, usually more or less twisted. Capsule coriaceous, inflated, 2-lobed, 2-celled, loculicidally 2-valved; cells 1-2-seeded. Seeds sub-globose, exalbuminous, usually arillate.—Distrib. About 6 species, tropical Asiatic, Australian and Madagascarian.

HARPULLIA CUPANIOIDES, Roxb. Hort. Beng. 86; Fl. Ind. ed.

Wall. II, 442: ed. 1832 I, 645. A tall tree: young parts minutely tawny, puberulous. Leaves 12 to 18 in. long, the rachises slightly puberulous; leaflets 6 to 12, opposite or alternate, oblong to elliptic-lanceolate, acute or shortly acuminate, the base obliquely cuneate, both surfaces glabrous; main nerves 8 to 12 pairs, curving upwards, puberulous or glabrous: length 2.5 to 8 in., breadth 1.35 to 2.75 in., petiolule 15 in. Panicles with few short branches, terminal or axillary, puberulous. Flowers large, 3 in. in diam. Sepals 5, free, unequal, broadly oblong or sub-rotund, minutely pubescent outside. Petals 5, narrower than the sepals but longer. Stamens 5, shorter than the petals, the anthers oblong. Disc small, puberulous. Ovary broadly ovoid, compressed, grooved, pubescent; style short, reflexed; stigma small, 2-lobed. Fruit capsular, broadly reniform, compressed, 2-lobed, glabrous. Seed semioval, the aril orange-coloured and covering the whole seed. Hiern in Hook. fil. Fl. Br. Ind. I, 692; Miq. Fl. Ind. Bat. Vol. I, pt. 2, 570: Kurz For. Flora Burma, I, 287: Wall. Cat. 8078. Harpullia rupestris, Bl. Rumphia, III, 175. H. fruticosa, Bl. l. c. 179. H. fraxinifolia, Bl. l. c. 176. H. thanatophora, Bl. l. c. 178. Streptostigma viridiflorum, Thwaites in Hook. Kew Journ., VI, 298, t. 9.

Perak: King's Collector, Nos. 1015, 7074; Scortechini. Andamans: King's Collector.

19. TURPINIA, Vent.

Trees or shrubs with glabrous and shining leaves, and smooth terete branches. Leaves opposite, stipulate, usually odd-pinnate; leaflets opposite, stipellate, serrulate, sub-coriaceous. Panicles terminal and axillary; flowers small, regular, hermaphrodite. Calyx 5-partite, imbricated. Petals 5, imbricated. Stamens 5, inserted outside the lobed or crenulate raised disc; filaments flattened; anthers short. Ovary sessile, 3-lobed and -celled; styles 3, combined or distinct; stigmas sub-capitate; ovules 2 together or more and then in two rows. Fruit sub-globose, indehiscent, 3-celled. Seeds angular; testa hard, shining; hilum large; albumen fleshy; aril 0. Embryo straight.—Distrib. About ten species in sub-tropical Asia and America.

Turpinia pomiferea, DC. Prod. II, 3. A tree 30 to 40 feet high, all parts glabrous. Leaves stipulate, 8 to 15 in. long, mostly unequally pinnate; leaflets 5 to 10, thinly coriaceous, oblong or oblong-lanceolate, shortly acuminate, the edges serrate, the base cuneate; main nerves 5 or 6 pairs, remote, ascending; length 2.5 to 8 in., breadth 1 to 3 in., petiolules of the lateral leaflets 25 to 35 in., of the terminal one varying from 1 to 2 in.; stipules interpetiolar or triangular, caducuons. Panicles spreading, shorter than the leaves; the branches diverging, brac-

teolate at the base, puberulous. Flowers numerous near the ends of the branches, '15 in. in diam., greenish-white. Calyx with 5 deep oblong obtuse lobes, puberulous or glabrescent. Petals oblong, longer than the calyx, puberulous. Stamens about as long as the petals, the filaments glabrous. Ovary broadly ovoid, furrowed, almost separable into 3 loculi, glabrous, tapering into the stout stylar column. Fruit globose, with fleshy smooth pericarp, slightly trigonous, 3-celled, 3-seeded. Miq. Fl. Ind. Bat. Vol. I, pt. 2, 593; Hiern in Hook, fil. Fl. Br. Ind. I, 698: Kurz For. Flora Burma I, 292; Wall. Cat. 4276. Dalrymplea pomifera, Roxb. Hort. Beng. 17; Cor. Pl. t. 299; Fl. Ind. I, 633. T. nepalensis, Wall. Cat. 4277; W. and A. Prodr. 156; Wight Ic. t. 972; Bedd. Fl. Sylv. t. 159; Thwaites Enum. 71. T. microcarpa, W. and A. Prodr. 156. T. martabanica, Wall. Cat. 4278. T. latifolia, Wall. Cat. 4939. Canarium Sajiga, Ham. ex W. and A. Prodr. 175.—Wall. Cat. 8104.

Perak: King's Collector, No. 4243.—Distrib. Java, Sumatra. British India.

Var. sphaerocarpa, King. Leaflets broadly ovate or ovate-rotund, only slightly and shortly acuminate. Panicles often longer than the leaves. Fruit not more than about '5 or '6 in. in diam., depressed. Turpinia sphaerocarpa, Hassk. Cat. Hort. Bat. Bogor. 228; Flora Vol. XXV (1842), Bibl. II, p. 42; Miq. Fl. Ind. Bat. Vol. I, pt. II, 593. Turpinia latifolia, Wall. Cat. No. 4939. Dalrymplea javanica, Hassk. Pl. Jav. Rar. 439.

In all the provinces except the Andamans and Nicobars. This is the common form in the Malayan Provinces.

Order XXXV .- SABIACE E.

Climbing or erect shrubs or erect trees, glabrous or with simple hairs. Leaves alternate, exstipulate, simple or compound. Flowers small or minute, hermaphrodite or polygamous, usually panicled. Calyx 4-5-partite, imbricate. Petals 4-5, equal or unequal, opposite or alternate with the sepals, imbricate. Disc usually small, annular. Stamens 4-5, opposite the petals, inserted at the base of or on the disc, all perfect or two only perfect and three without anthers; filaments clavate, flattened or subulate; anthers didymous, cells distant bursting transversely or by a deciduous cap. Ovary 2-3-celled, compressed or 2-3-lobed; styles 2-3, free or connate, or 0, stigmas punctiform; ovules 1-2 in each cell. Ripe carpels 1-2, dry or fleshy, indehiscent. Seeds compressed or globose, basilar, hilum broad, testa membranous or coriaceous, albumen 0; embryo various, cotyledons often contorted, radicle deflexed. Distrib. A small chiefly Indian order, with 4 genera and about 35 species. J. II. 58

Stamens 4-5, all perfect and equal ... 1. Sabia.
Stamens 5, very unequal ... 2. Meliosma.

1. Sabia, Coleb.

Climbing or sarmentose shrubs; branches with the bud-scales persistent at their bases. Leaves quite entire. Flowers axillary, solitary, cymose or panicled, usually hermaphrodite, 2-bracteate; bracts, calyx, corolla, stamens and carpels all opposite. Calyx 4-5-partite. Petals 4-5, with transparent lines, green, purplish or yellow. Disc annular, 4-5-lobed. Stamens 4-5, inserted at the base of the disc; anthers extrorse or introrse. Carpels 2, rarely 3, cohering slightly; styles 2, erect, terminal, cohering slightly; ovules 2 in each carpel, collateral or superposed, horizontal. Ripe-carpels 1 or 2, gibbous, with a sub-basal style, dry or drupaceous. Seed reniform, testa coriaceous, dotted; embryo curved, cotyledons straight or incurved, flat, rugose or undulate, radicle cylindric.—Distrib. About 16 species, natives of tropical and temperate India.

Flowers solitary, axillary ... 1. S. sumatrana. Flowers in racemes or panicles ... 2. S. limonacea.

1. Sabia sumatrana, Blume Mus. Bot. Lugd. Bat. I, 370. A woody climber: young shoots with cinereous bark, sub-glabrous. Leaves ovate-lanceolate to elliptic, acuminate, entire, the base cuneate; upper surface glabrous, the lower minutely puberulous and sub-lepidote; main nerves about 5 pairs, much curved, the reticulations wide; length 3.5 to 7 in., breadth 1.25 to 3.5 in., petiole 35 to 75 in. Peduncle solitary, axillary, 35 in. long (longer in fruit). Sepals broadly triangular, pubescent at the edges. Petals much longer than the sepals, lanceolate, glabrous. Stamens nearly as long as the petals, but shorter than the cylindric glabrous style. Fruit compressed, obliquely ovoid, glabrous, when ripe bright blue with dark spots. Miq. Fl. Ind. Bat. Vol. I, pt. 2, 619.

Perak: Scortechini; King's Collector, Nos. Nos. 2117, 5053, 8205.

2. Sabia Limonacea, Wall. Cat. 1000. A lofty climber: young branches slender, glabrous. Leaves coriaceous, oblong or lanceolate, acute or acuminate, entire; the base cuneate, rarely rounded; both surfaces glabrous, the upper shining and reticulate, the lower paler and tesselate-reticulate; main nerves 5 or 6 pairs, curved, faint; length 2.5 to 6 in., breadth 1 to 1.75 in.; petiole 6 in. Flowers 15 in. in diam., in axillary or slightly supra-axillary racemes or racemoid panicles usually shorter than the leaves, glabrous; pedicels longer than the flowers. Sepals 5, green, oblong, blunt. Petals 5, larger than the sepals,

obovate. Stamens included, the filaments clavate, the authers short with broad connective. Fruit solitary or paired, compressed, obliquely orbicular or elliptic, 5 in. long. Hook. fil. and Thoms. Fl. Ind. I, 210; Hook. fil. Fl. Br. Ind. II, 3. Celastrina, Wall. Cat. 9015; Sabia sp. Griff. Notul. IV, 423; Ic. Pl. As. t. 568. p. 2.

Penang: Curtis, Nos. 1221, 2158. Perak: Scortechini, No. 628.—DISTRIB. British India at the base of the Eastern Himalayan and Assam Range, Chittagong.

Sabia viridissima, Kurz in Journ. As. Soc. Bengal, Vol. XLI, Pt. 2, (1872), p. 304, is, as Kurz's type specimens in the Calcutta Herbarium clearly prove, a mixture of Erythropalum scandens, Blume, and an undescribed species of Blachia which I propose to name B. viridissima.

2. Meliosma, Blume.

Trees or shrubs, pubescent or glabrous. Leaves simple or unequally pinnate; leaflets sub-opposite, the terminal one rarely wanting. Flowers in branched terminal or terminal and axillary panicles, small or minute, hermaphrodite, rarely unisexual; bracts caducous. Bracteoles and sepals 5-9, persistent, forming an uninterrupted whorl round the petals. Petals 5; 3 large, nearly orbicular, valvate; 2 smaller, interior, placed behind the fertile stamens, either membranous and nearly free or reduced to a bifid scale adnate to the filament. Stamens 5; 2 fertile, opposite the smaller petals; filament short, flattened, incurved, expanded at the top into a cup which bears two globose cells that burst transversely, springing back elastically; 3 deformed, broad, opposite the larger petals, 2-fid with 2 empty cells, together forming a cup over the pistil. Disc cupular or annular, with 2-5 simple or dentate teeth. Ovary sessile, 2- rarely 3-celled, contracted into a simple or 2-partible style, stigma simple; ovules 2 in each cell. Drupe small, oblique, sub-globose; stone crustaceous, 1-celled, with usually a basilar rounded projection over which the seed is curved. Seed globose, testa membranous; cotyledons conduplicate, radicle incurved.—DISTRIB. Species about 32; natives of Tropical Asia and Malay Archipelago, with a few in S. America.

Leaves simple.

Petals 5; flowers '05 in. in diam. ... 1. M. elliptica.
Petals 0; flowers '1 in. in diam. ... 2. M. lancifolia.
Leaves pinnate.

Leaflets quite glabrous.

A shrub; leaves 12 to 18 in. long; leaflets 7 to 13; main nerves 7 to 10 pairs ... 3. M. nitida. A tree; leaves 30 to 40 in. long; leaflets 21 to 25; main nerves 14 to 16 pairs ... 4. M. levis.

Leaflets hairy, especially on the under surface.

Flowers in clusters, sessile, buds globose ... 5. M. lanceolata. Flowers solitary, shortly pedicelled, buds oblong ... 6. M. Ridleyi.

1. Meliosma elliptica, Hook. fil. Fl. Br. Ind. II, 5. A tree 20 to 40 feet high; young branches, petioles, the midribs of the leaves on both surfaces, and the lower surface especially on the nerves densely rusty-pubescent or tomentose. Leaves elliptic or oblanceolate, shortly caudate-acuminate, the edges entire or remotely serrate, gradually narrowed from above the middle to the petiole: upper surface glabrous except the midrib and puberulous nerves; main nerves about 10 pairs, curving upwards, the transverse veins distinct; length 4 to 9 in., breadth 1.25 to 3 in.; petiole 5 to 1.5 in. Panicle terminal, usually on rather a long peduncle, longer than the leaves, the branches rather few and short. Flowers crowded, sessile, .05 in. in diam. Bracteoles pubescent. Sepals 4, sub-coriaceous, orbicular, very concave, shining, sub-ciliolate. Petals 5, darker in colour than the sepals but of similar shape, thick, opaque and dotted, glabrous. Fertile stamens 2 to 4. Fruit sub-globular, ridged, sub-gibbous at the base, glabrous, 2 to 25 in. in diam. Sabia floribunda, Mig. Fl. Ind. Bat. Suppl. 521.

Malacca: Griffith, No. 1025; Maingay, Derry. Perak: King's Collector, Nos. 4051, 5468, 5469, 6150, 8103, and 10659.—Singapore.

DISTRIB. Sumatra.

This is closely allied to *M. simplicifolia* which has however its flowers in ultimate cymlets of 3, whereas in this the flowers are single. The sepals moreover in *M. simplicifolia* are thinner and more pubescent than in this. As a rule the leaves in this species are quite entire; but in several of the Perak specimens they are coarsely serrate, without in any other respect departing from the typical form.

2. Meliosma lancifolia, Hook fil. Fl. Br. Ind. II, 5. A tree: young branches petioles and inflorescence rusty-villous. Leaves thinly coriaceous, oblanceolate-acuminate, entire, gradually narrowed from above the middle to the petiole; both surfaces distinctly reticulate, the upper shining, glabrous except the tomentose midrib and nerves; lower villous on the midrib and nerves, otherwise with scattered hairs; main nerves 20 to 24 pairs, spreading, curved, interarching freely; length 12 to 18 in., breadth 3.5 to 4 in., petiole 75 in. Panicle shorter than the leaves, pedunculate, the branches few and short and the flowers sessile and crowded. Flowers about 1 in. in diam.; bracteole oblong, pubescent, shorter than the 4 ovate glabrous sepals: petals 0, fertile; stamens 2 or 3, shorter than the sepals. Ovary elliptic; style short, terminal. Fruit transversely ovoid-globose, keeled, glabrous, 3 in. in diam.

Malacca: Maingay, No. 463/2. Perak: Scortechini.

3. Meliosma nitida, Blume Cat. Hort. Bot. Bogor. 32; Rumphia, III, 202, t. 169. A shrub or small tree: young branches glabrous, lenticellate. Leaves 12 to 18 in. long, unequally pinnate, quite glabrous, the rachises deeply channelled on the upper surface; leaflets coriaceous, 7 to 13, opposite or alternate, elliptic-ovate or obovate-lanceolate, acute or shortly acuminate, entire, the base more or less cuneate, rarely rounded; both surfaces quite glabrous, the lower paler and prominently reticulate: main nerves 7 to 10 pairs, spreading, curving upwards, interarching at some distance from the margin; length 4 to 12 in., breadth 1.75 to 4.25 in.; petiolules .35 to .75 in. Panicles terminal or axillary, rather shorter than the leaves, scurfy-puberulous, the branches short and the flowers densely crowded. Flowers '1 in. in diam., shortly pedicelled; the buds pointed, the bracteole single and coriaceous. Sepals 4, sub-rotund, concave, spreading. Petals 5; the 3 outer rotund, valvate, the sutures of their edges prominent; the two inner completely enclosed, small, each with a stamen opposite it. Stamens 2; the hooded anther broad, expanded and with two rotund diverging lobes separated by a wide connective, the filament tapering to a narrow base. Ovary ovoid. Fruit obliquely elliptic when young, slightly flattened on one side and keeled on the other; when ripe ovoid-rotund, about 1 in. long and 8 in. in diam. Blume Rumphia III, 202. t. 169; Miq. Fl. Ind. Bat. I, pt. 2. 617. Meliosma sumatrana, Hook fil. Fl. Br. Ind. II, 6. Millingtoma sumatrana, Jack in Mal. Misc. II, 39; Nees in Flora for 1825, 106; Miq. Fl. Ind. Bat. l.c. Irina integerrima, Blume Bijdr. 231.

Malacca: Griffith, Maingay, No. 461. Penang: Curtis, No. 2836. Perak: (very common) King's Collector.—Distrib. Sumatra.

4. Meliosma levis, King n. sp. A tree 40 to 50 feet high: leaves 30 to 40 in. long; the rachises and petioles puberulous and terete, the latter swollen at the base; leaflets 10 to 12 pairs, coriaceous, narrowly oblong-lanceolate, caudate-acuminate; the edge entire, recurved when dry, the base rather abruptly cuneate: both surfaces glabrous; the upper dull, opaque, olivaceous when dry, the lower pale brown, tesselate-areolate; main nerves 14 to 16 pairs, spreading, curving, interarching far from the edge: length 5 to 7 in., breadth 1 to 1.25 in.; petiole '35 in. Panicles about as long as the leaves with lax raceme-like branches, sparsely covered with very short coarse rusty hairs. Flowers less than 'l in. in diam., sessile on very short woody lateral branchlets; bracteoles two, unequal, broadly oblong, pubescent. Sepals 2, sub-orbicular, concave, erect, thick, puberulous outside. Petals 5; the three outer larger than the sepals, very concave, glabrous, the two inner small and irregular. Stamens 2, or sometimes 3, the anther with wide hooded connective. Fruit unknown.

Perak: King's Collector, No. 7893.

This is allied to *M. lanceolata*, Bl., but it appears to me to differ from that and from every other described species. From *M. lanceolata* it is readily distinguished by its more numerous perfectly smooth leaflets tesselate-reticulate beneath; by its flowers on short ultimate branchlets; by its double bracteole and concave petals.

5. Meliosma lanceolata, Blume Cat. Hort. Bot. Bogor. 32; Rumphia III, 200, t. 168. A tree: young branches stout, more or less covered with short deciduous rusty tomentum. Leaves 12 to 24 in. long; the petiole stout, terete, swollen at the base, the rachis glabrescent or puberulous; leaflets 6 to 8 pairs with one odd, very coriaceous, oblong, shortly acuminate; the edges entire, recurved when dry: the base rounded or slightly cuneate, sometimes oblique; upper surface smooth and shining, usually very rugulose from the depression of the nerves and reticulations: lower surface dull, the midrib nerves and reticulations very prominent and with numerous flexuose sub-adpressed hairs: length 3 to 6 in., breadth 1.25 to 2 in.; petiolules 2 to 35 in. long, stout, pubescent. Panicles very large, with long raceme-like Flowers in rather close clusters, sessile, branches, rusty-pubescent. 1 in., in diam.; bracteole single. Sepals 3, orbicular-triangular, blunt, sub-glabrous. Petals 5; the three outer orbicular, flat and much larger than the sepals; the two inner small, irregular, shorter than the stamens. Stamens 2, shorter than the outer petals, the anthers very broad. Fruit sub-globular, compressed, boldly keeled, glabrous, 3 in. in diam. Hook. fil. Fl. Br. Ind. II, 7.

Malacca: Griffith, No. 1022; Maingay, No. 361; Derry, Nos. 21

and 1122. Singapore: Ridley, Nos. 347, 1892, 3876.

Var. pubescens, Hook. fil. Fl. Br. Ind. II, 7. Under surfaces of the leaves and inflorescence densely and softly rusty-tomentose; fruit 4 in. in diam.

Singapore: Ridley, No. 6341.

6. Meliosma Ridleyi, King n. sp. A medium tree: leaves 15 in. or more in length, their rachises densely and minutely rufous-tomentose: leaflets 11 to 15, opposite or alternate, thinly coriaceous, oblong or oblong-lanceolate, shortly acuminate, the base abruptly and obliquely cuneate; upper surface not rugulose, sparsely adpressed-pubescent, the midrib and nerves tomentose: under surface minutely rufous-pubescent, the midrib and nerves with dense long shining hairs: main nerves 7 or 8 pairs, ascending, curving, the reticulations distinct: length 2.5 to 5 in., breadth 9 to 1.2 in.; petiolules 1 to 2 in., tomentose. Panicle longer than the leaves, densely rufous-tomentose, with short branches bearing the ultimate spikes of flowers. Flowers solitary, oblong, not globular

even in bud, under '1 in. long. Bracteoles two, unequal, ovate, acute, pubescent; pedicel of flower very short. Sepals 5, ovate, blunt, concave, erect, shortly ciliolate at the edges. Petals and stamens absent. Ovary broadly ovoid, tomentose; style thick, conical, glabrescent. Fruit unknown.

Singapore: Ridley, No. 6342.

The only specimens of this are in flower; and, the ovaries having been fertilised, the petals and stamens (as is the case in other species of *Meliosma*) have fallen off. The only specimens known are Mr. Ridley's. They were collected in the little patch of forest which forms an adjunct to the Botanic Garden of Singapore, which is one of the few pieces of the original vegetation of the island which have escaped the ravages of axe and spade. In leaf this plant is not unlike *M. lanceolata*, Bl., but the nervation and pubescence of the leaflets are different.

Note.—Besides the foregoing, there are in the Calcutta Herbarium specimens from Singapore (Herb. Ridley, without a number) of a pinnate-leaved Meliosma. None of these are in fruit, but there are plenty of flowers, and these closely resemble the flowers of M. lanceolata, Bl. The leaflets of this plant are narrowly oblong, of rather thinner texture than those of M. lanceolata, and their upper surfaces are not glabrous (except the pubescent midrib), and they are not at all rugulose; the under surfaces are densely covered with unequally long shining hairs.

Nat. Ord. XXXVI, ANACARDIACEAE.

Trees or shrubs usually with oleo-resinous often acrid juice. Leaves alternate (opposite in Bouea), simple or compound. Flowers small, regular, unisexual, polygamous, sometimes hermaphrodite, usually in panicles. the ultimate branchlets being cymose. Calyx 3-5-partite, sometimes accrescent (spathaceous in Gluta, calyptrate in Melanorrhoea). Petals 3 to 5, alternate with the segments of the calyx, free, imbricate or valvate in bud, sometimes accrescent, rarely absent. Disc flat, cupular or annular, entire or lobed, rarely obsolete. Stamens equal in number to the petals, or fewer, or more numerous, often abortive, inserted beneath the disc, rarely on it: filaments often subulate; the anthers 2-celled, basi- or dorsi-fixed. Pistil in the male flower usually absent, in the female solitary, or pistils 4 or 6 and apocarpous, or 2 to 5 and syncarpous: ovary mostly superior (half-inferior in Holigarna) the loculi with a single ovule pendulous from the top of the cell or from its side, or from an ascending funicle rising from the base: styles 1 to 5 and free, or the stigma sub-sessile, or simple or lobed. Fruit superior (except in Holigarna and Drimycarpus) and drupaceous, with one cell and one seed, and sometimes with accrescent sepals or petals; or a false drupe with a 2- to 5celled stone covered by pulp. Seed exalbuminous: the embryo straight or curved: cotyledons plano-convex, radicle short .- DISTRIB. chiefly tropical: about 430 species in 55 genera.

Sub-Order I. Anacardiae. Ovary 1-eclled (in all the Asiatic species).

Tribe I.—Mangiferae. Carpels solitary, or 5 with only one fertile; style usually lateral or gynobasic, ovules pendulous, or semi-pendulous (in Anacardium) from a basal funicle; ovary often with a gynophore; stamens in one or more whorl, sometimes reduced to a single individual; leaves simple.

Neither sepals nor petals accrescent.

Carpels 5, rarely 4 or 6; stamens 10 ... 1. Buchanania. Carpel solitary.

Leaves opposite ... 2. Boues.

Leaves alternate.

Calyx 4-5-partite, stamens 1 to 5; drupe with succulent mesocarp, the endocarp hard and fibrous, the peduncle not enlarged Calyx 4-5-partite, stamens 8 to 10 all or only a few perfect; drupe reniform, compressed, the peduncle much enlarged Calyx spathaceous, petals 4 to 6; torus stipitate, drupe sub-ligneous, tubercled or ridged, the endocarp leathery

Petals accrescent.

Calyx calyptriform; stamens 5 or numerous ...

Calyx 5-partite; stamens 5, drupe stalked

Tribe II.—Rhoideae. Carpels solitary or 3 and united; styles terminal or lateral, free or connate below; ovary 1-celled; ovule solitary, rising by a short funicle from the base or from near the base of the cell, or suspended from the wall near the apex; stamens in 1 or 2 whorls; fruit drupaceous, 1-celled, 1-seeded, sometimes with the accrescent calyx-segments at its base (obscurely 2-celled in Drepanospermum); embryo usually curved, rarely straight: leaves simple, trifoliolate or pinnate.

Z. DOUEA.

3. Mangifera.

4. ANACARDIUM.

5. GLUTA.

6. MELANORRHOEA.

7. SWINTONIA.

Leaves simple.

Sepals accrescent, fruit sessile; flowers 4-merous, embryo straight ...

Sepals not accrescent; flowers 5 merous;

stamens 6 to 10, style 1, embryo curved ... 9. CAMPNOSPERMA.

8.

Parishia.

Leaves pinnate; petals imbricate. Stamens 5, alternating with 5 staminodes.

Stigma erect, 3-lobed 10. MICROSTEMON.

Stigma flat, much bent, not 3-lobed ... 11. PENTASPADON.

Stamens 4 to 10; staminodes none.

Stamens 4 to 10; styles 3; drupe solitary, small, compressed, 1-celled,

1-seeded, not crowned by the styles ... 12.

Stamens 8 to 10; styles 3 or 4; drupe reniform, compressed, 1-celled, 1-seeded,

crowned by the distant styles ... 13. ODINA.

Tribe III.—Semecarpeae. Ovary consisting of three united carpels, unilocular, free or immersed in and adnate to the cupular or tubular disc; ovule solitary, suspended by a funicle from the side of the loculus above its middle or just below the apex, stamens in a single row; styles 3; drupe large, usually connate with the enlarged more or less fleshy peduncle, inferior in Drimycarpus.

Drupe superior.

Petals valvate, stamens 5, style 1; calyxtube persistent, much enlarged in the fruit and adnate to the base of the drupe 14. MELANOCHYLA. Petals imbricate, stamens 5, styles 3, drupe on a much enlarged fleshy receptacle...

... 15. SEMECARPUS.

Drupe inferior.

Petals imbricate, stamens 5, style 1, ovary inferior, drupe transversely ovoid ... 16. DRIMYCARPUS.

Sub-Order II. SPONDIAE. Ovary and drupe 2- to 5-celled, ovules pendulous.

Flowers bisexual, 5-merous, stamens 10; styles 5, thick, connate by their apices; drupe 5celled, sometimes fewer-celled by abortion ... 17. DRACONTOMELUM.

Ј. н. 59

1. BUCHANANIA, Roxb.

Trees. Leaves alternate, petioled, simple, quite entire. Panicles terminal and axillary, crowded. Flowers small, white, hermaphrodite. Calyx short, 3-5-toothed or -lobed, persistent, imbricate. Petals 4-5, oblong, recurved, imbricate. Disc orbicular, 5-lobed. Stamens 8-10, free, inserted at the base of the disc. Carpels 5-6, free, seated in the cavity of the disc, one fertile, the rest imperfect; style short, stigma truncate; ovule 1, pendulous from a basal funicle. Drupe small, flesh scanty; stone crustaceous or bony, 2-valved. Seed gibbous, acute at one end; cotyledons thick; radicle superior.—DISTRIB. A tropical Asiatic, Australian and Polynesian genus; species about 25.

Anthers not sagittate at the base ... 1. B. platyneura. Anthers sagittate at the base.

Leaves always sharply acuminate at the apex, the lower surface of the midrib pubescent; panicles pubescent 2. B. sessilifolia. Leaves rounded or obtuse at the apex, sometimes shortly and bluntly acuminate, everywhere glabrous: panicle glabrous ... 3. B. florida.

I. BUCHANANIA PLATYNEURA, Kurz in Journ. As. Soc. Bengal XLV (1876), pt. 2, p. 125. A tree 40 to 60 feet high, the young shoots deciduously puberulous. Leaves coriaceous, narrowly elliptic to elliptic-Janceolate, shortly and bluntly acuminate, the base cuneate and sometimes slightly unequal; both surfaces glabrous and shining, the reticulations when dry distinct or not, the midrib broad on both surfaces; main nerves 11 to 13 pairs, spreading, curving; length 4 to 9 in. or even Il in., breadth 1.75 to 2.5 in., petiole .5 to 1 in. Panicles crowded at the ends of the branches, axillary, erect, shorter or longer than the leaves, shortly pedunculate, puberulous; their branches short, slender, horizontal, cymosely few-flowered. Flowers 'l in. in diam., on minutely bracteolate pedicels longer than themselves. Sepals 4, thick, ovate or elliptic, obtuse, much shorter than the petals. Petals 4, oblong, very blunt, spreading and reflexed. Stamens 8; the anthers narrow, elongate, the bases not sagittate, the apices recurved; filaments longer than the anthers, flat. Pistils several, one only ripening. Drupe sub-globular, with 4 vertical ridges, two prominent and two obscure, glabrous, purplish-black when ripe; the stone hard, '4 in. in diam. Engler in DC. Mon. Phan. IV, 193.

The Andaman and Nicobar Islands: very common.

This is put by Engler amongst doubtful species—no doubt as the result of his not having seen good specimens; for the species is a very well-marked one. Its nearest ally is the Sumatran species B. splendens, Miq.

2. Buchanania sessilifolia, Blume Mus. Bot. Lugd. Bat. I, 184. A shrub or small tree, the young branches puberulous and not swollen, ultimately glabrous. Leaves thinly coriaceous, oblanceolate, always abruptly acuminate at the apex and much narrowed to the base, either with a short petiole or sessile; the upper surface glabrous and rather dull, the lower pale-brown when dry and glabrous except often the sparsely adpressed-pubescent midrib; main nerves 13 to 15 pairs, spreading, slightly prominent on the lower surface; length 3.5 to 7 in., breadth 1.5 to 2.5 in.; petiole none or from 1 to 6 in. long. Panicles pedunculate. exceeding the leaves, slender; the branches divaricate, and with the flowers crowded towards their apices, sparsely pubescent. Flowers :15 in. in diam., on short pedicels. Sepals 5, sub-rotund, puberulous. Petals 5 or 6, much larger than the sepals, oblong, blunt with the apices recurved, glabrous. Stamens 8 or 10: the anthers sagittate, the basal lobes rounded and swollen; the filaments short, thick, compressed. Pistils several. Drupe sub-cordate, rotund, compressed, glabrous, about 35 in. long. Miq. Fl. Ind. Bat., Vol. I, pt. 2, 637; Suppl. 523; Engler in DC. Mon. Phan. IV, 191. B. acuminata, Turez. in Bull. Mosc. (1858). I, 472; Hook, fil. Fl. Br. Ind. II, 24; Kurz For. Flora Burma, I, 308. Hypericinea lucida, Wall. Cat. 4827. Terebinthacea, Wall. Cat. 8505, (fide Hook. fil.)

In all the Provinces except the Andamans and Nicobars: very common.—DISTRIB, the Malayan Archipelago.

This differs from all the forms of *B. florida*, Schauer, in having more acuminate leaves of thinner texture, with the midrib pubescent on the lower surface, and with rather more numerous nerves: and also in having a pubescent panicle and larger fruit. There is considerable variation as to the petiole. In some specimens there is no petiole at all, and it is to these which Blume gave the name *B. sessilifolia*, Turczaninoff's name *B. acuminata*, being applicable to all the forms, is a far more appropriate one; and Sir Joseph Hooker adopts it although the procedure is, as he admits, "against the laws of priority;" for Turczaninoff's species was not published until 1858, whereas Blume dates from 1851.

3. Buchanania fiorida, Schauer in Nov. Act. Caes. Leop. Carol. XIX, Suppl. I, 481. A small glabrous tree, young branches close to the leaves, thick and with many cicatrices. Leaves thinly coriaceous, oblong-lanceolate to obovate-oblong, the apex rounded or obtuse; narrowed from below the middle to the broad channelled somewhat winged petiole; both surfaces shining, reticulate; main nerves about 12 pairs, the intermediate veins very distinct; length 4 to 5.5 in., breadth 1.25 to 1.75 in.; petiole 5 to .75 in. Panicles crowded about the ends of the

branches, axillary, longer than the leaves, narrow, lax, the branches short, bracteoles minute. Flowers on pedicels longer than themselves, 25 in in diam. Sepals 4 or 5, orbicular, slightly unequal. Petals 4 or 5, larger than the sepals, elliptic, obtuse. Stamens 8, the anthers elongate, cordate at the base; the filaments shorter, subulate. Pistils 3 or 4, but one only fertile. Drupe broadly ovoid or sub-globular, slightly compressed, about 25 in long. Engl. in DC. Mou. Phan. IV, 188.

Var. lucida, Engler l. c. 189: Leaves oblong-lanceolate, sometimes shortly and obtusely acuminate, the nerves and veins very prominent. B. lucida, Blume Mus. Bot. Lugd. Bat. I, 184; Hook. fil. Fl. Br. Ind. II, 24; Miq. Fl. Ind. Bat. I, pt. 2, p. 637. B. palembanica, Blume l. c. 186; B. subobovata, Griff. Not. IV, 413. B. polybotrya, Miq. Fl. Ind. Bat. I, pt. 2, p. 638. Hypericinea angustata, Wall. Cat., No. 4830. B. arborescens, Blume Mus. Bot. Lugd. Bat. I, 183; Kurz For. Flora Burma, I, 308.

Penang, Kedah, Singapore, Malacca, Perak:—Distrib. Sumatra, Burma.

This, although widely distributed in the Malayan Peninsula, does not appear to be any thing like so abundant a tree as B. acuminata, but it is more common than the following variety.

Var. petiolaris, Engl. l. c. 189: Leaves obovate-oblong, contracted at the base into the long cuneate petiole. B. petiolaris, Miq. Fl. Ind. Bat. Vol. I, pt. 2, p. 637. B. bancana, Miq. Fl. Ind. Bat. Suppl. 523.

Penang: Wallich (Cat. No. 4831). Singapore: Ridley, Nos. 438, 1882.

2. Bouea, Meissn.

Trees. Leaves opposite, petioled, coriaceous, glabrous, quite entire. Flowers small, in axillary and terminal panicles, polygamous. Sepals 3-5, deciduous, valvate. Petals 3-5, vertically keeled on the inner face, imbricate. Disc very small. Stamens 3-5, inserted within the disc, all fertile. Ovary sessile; style short, terminal, stigma obscurely and unequally 3-lobed; ovule ascending from the wall of the cavity. Drupe fleshy; stone thin, fibrous, 1-celled, 1-seeded. Seed suberect; cotyledons fleshy; radicle very short, inferior.—Distrib. Species 5, natives of Tropical Asia and the Malay Archipelago.

Leaves 3 to 5 in. long; panicles laxly flowered; sepals puberulous; petals oblong, erect; fruit ·6 to ·75 in. long ... 1. B. burmanica.

Leaves 5 to 8 in. long; panicles densely flowered; sepals tomentose; petals oblanceolate-oblong, spreading; fruit more than 2 in. long ... 2. B. macrophylla.

1. BOUEA BURMANICA, Griff. Plant. Cantor. 14. A glabrous tree 50 to 60 or even 90 feet high; young branches slender. Leaves thinly coriaceous, oblong-lanceolate, shortly and obtusely acuminate, the base cuneate: main nerves 10 to 15 pairs, spreading, slightly depressed on the upper and slightly projecting on the lower surface; length 3 to 5 in., breadth 1 to 2 in.; petiole 25 to 5 in. Panicles much shorter than the leaves, terminal or axillary, slender, with a few spreading laxly-flowered puberulous branches, bracteoles absent. Flowers oblong, less than 'l in. in diam., glabrous, on pedicels longer than themselves. Sepals 4, unequal, leathery, broadly ovate, puberulous. Petals 4, very thick, erect, oblong, obtuse, longer than the sepals, quite glabrous. Stamens 3 to 5, shorter than the petals, the anthers linear, the filaments short. Ovary obliquely ovoid. Drupe obliquely ovoid, slightly apiculate, 6 to 1 in, long. Hook, fil. Fl. Br. Ind. II, 21; Kurz For. Flora Burma, I, 306; Engler in DC. Mon. Phan. IV, 240. B. oppositifolia, Meissn. in Walp, Rep. I. 556; Kurz For. Flora Burma, l. c. 306. B. Brandisiana, Kurz in Journ. As. Soc. Beng. 1871, II, 50: 1873, II, 66. Mangifera oppositifolia, Roxb. Fl. Ind. I, 640; Hort. Beng. 18; Wall. Cat. 8490. Cambessedea, W. and A. Prodr. I, 170.

In all the Provinces .- DISTRIB. Burma.

Var. microphylla, Engl. in DC. Mon. Phan. IV, 240. All the parts smaller than in the type. Bouea microphylla, Griff. Plant. Cantor. 15; Notul. IV, 423; Hook. fil. Fl. Br. Ind. II, 21. B. diversifolia, Miq. Fl. Ind. Bat. Suppl. 522. B. myrsinoides, Blume Mus. Bot. t. I, 204; Miquel l. c. I, pt. 2, 635.

Malacca: Griffith, 1106; Maingay, 479. Singapore: Ridley; Hullett, No. 660.

2. Bouea macrophylla, Griff. Plant. Cantor. 15: Notulae, IV, 420. A tree, all parts glabrous except the inflorescence. Leaves coriaceous, oblong-lanceolate, the apex very shortly and bluntly acuminate, the base cuneate or rounded; both surfaces shining; main nerves 18 to 20 pairs, spreading, slightly depressed on the upper and prominent on the lower surface; length 5 to 8 in., breadth 1.65 to 2.65 in.; petiole .75 to 1 in. Panicles axillary and from the axils of old leaves, 2 to 4 in. long, puberulous; their branches spreading, short, and densely flowered. Flowers .1 in. in diam., on tomeutose pedicels shorter than themselves. Sepals 3 or 4, ovate, unequal, blunt, spreading, tomentose externally. Petals 3 or 4, oblanceolate-oblong, rather thick, glabrous. Stamens 3 or 4, about as long as the sepals: anthers ovate, slightly longer than the filaments. Ovary narrowly ovoid, pubescent. Drupe "ovoid-oblong, as large as a hen's egg" (Griff.), pulp abundant; stone leathery, fibrous. Hook. fil. Fl. Br. Ind. II, 21; Engler in DC. Mon.

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Phan. IV, 239. B. Gandaria, Blume Mus. Bot. Lugd. Bat. I, 204, (sub B. oppositifolia.)

Malacca: Griffith, No. 1105; Maingay, No. 478. Perak: Scortechini, No. 1938; King's Collector, No. 679.

This species has larger leaves and fruit than B. burmanica, and the panicles are much more densely flowered than in that species. The calyx moreover in this is very tomentose, and the petals are narrow oblanceolate and spreading.

3. Mangifera, Linn.

Trees. Leaves alternate, petioled, quite entire, coriaceous. Flowers small, polygamous, in terminal panicles, pedicel articulate; bracts deciduous. Sepals 4 or 5, imbricate, deciduous. Petals 4-5, free or adnate to the disc, imbricate; nerves thickened, sometimes ending in excrescences. Stamens 1-5, rarely 8, inserted just within the disc, or on it, 1 usually more perfect and much larger than the others; the others with imperfect or smaller anthers, or reduced to teeth or quite absent. Ovary sessile, 1-celled, oblique; style lateral; ovule pendulous, funicle basal, or inserted on the side of the cell above its base, rarely horizontal. Drupe large, fleshy; stone compressed, fibrous. Seed large, compressed, testa papery; cotyledons plano-convex, often unequal and lobed.—Distribet tropical Asiatic, chiefly Malayan; about 30 species.

Disc fleshy, tumid, more or less deeply 4- or 5-lobed, the petals inserted at its base.

Sepals and petals 4, stamen 1.

Panicles puberulous.

Leaves narrowly elliptic or elliptic-oblong, tapering much to each end, thinly coriaceous; petioles 1 to 1.25 in. long ...

Leaves elliptic, sub-coriaceous, petioles ...

Leaves broadly elliptic, slightly obovate, thickly coriaceous; petioles ...

...

Panicles quite glabrous.

ceolate.

Leaves not reticulate, or very indistinctly so on the lower surface only ...

Leaves distinctly reticulate.

Leaves broadly oblanceolate or obovate-elliptic 5.
Leaves elliptic-oblong or oblong-lan-

1. M. Griffithii.

2. M. microphylla.

3. M. sclerophylla.

4. M. Maingayi.

5. M. andamanica.

Petioles of leaves 2 to 4.5 in. long, thickened and dilated near the base; flowers 8 to 12 on the ultimate branchlets, racemose ... 6. M. longipetiolata. Petioles of leaves .75 to 1.2 in. long, only slightly thickened at the base; flowers on the ultimate branchlets in cymules of 3. ... 7. M. quadrifida. Sepals and petals 5. Stamens 5 all fertile; panicle as in M. indica ... 8. M. pentandra. ... Stamen 1 perfect, with or without abortive ones (staminodes). Panicle minutely tomentose or pubescent 9. M. indica. Panicle quite glabrous. Leaves very coriaceous ... IO. M. oblongifolia. Leaves thinly coriaceous. Leaves oblong, or elliptic-oblong, 5 to 8 in. long., with 16 to 20 pairs of prominent main nerves; stamen longer than the petals 11. M. longipes. Leaves elliptic-lanceolate, 3 or 4in. long, with 10 or 12 pairs of indistinct main nerves; the petals shorter than the stamen ... 12. M. gracilipes. Disc minute or absent. - Panicles glabrous (black when dry) stamens attached to the minute disc. Leaves elliptic-lanceolate, acute or acuminate, reticulate, main nerves about 20 pairs; flowers 25 in. long, drupe oblong... 13. M. odorata. Leaves elliptic-oblong, obtuse or sub-acute, the reticulations indistinct or obsolete, main nerves 15 to 18 pairs; flowers .35 in. in diam., disc cylindric; drupe elliptic to globose 14. M. foetida. Leaves narrowly linear-oblong or linearlanceolate, with 25 to 35 pairs of main nerves, both surfaces conspicuously reticulate; flowers nearly 3 in. long; drupe obliquely and broadly oblong-globose ... 15. M. fragrans.

Panicles puberulous, flowers 35 in. long; leaves with obtuse or rounded apices; stamens 5 or 6, all perfect ... 16. M. lagenifera. Panicles tomentose or pubescent; petals adnate to the cylindric torus.

Flowers not more than '3 in. long.

Leaves sessile or sub-sessile, oblanceolate or obovate-oblong, 9 to 15 in. long, panicle 20 to 30 in. long ... 17. M. kemanga.

Leaves broadly lanceolate or elliptic-oblong, shortly acuminate, 6 to 12 in. long; panicle 12 to 15 in. long. ... 18. M. caesia.

Flowers '75 in. long, with large concave bracts... 19. M. superba.

1. Mangifera Griffithii, Hook. fil. in Trans. Linn. Soc. XXII, 168. A tree with stout glabrous branches. Leaves thinly coriaceous, narrowly elliptic or elliptic-oblong, tapering from about the middle to each end, the apex sub-acute or very shortly and bluntly acuminate, the base cuneate, both surfaces glabrous and reticulate; main nerves about 14 to 16 pairs, spreading, slightly raised on both surfaces; length 5 to 7 in., breadth 2 to 2.5 in.; petiole 1 to 2.5 in. Panicles coarsely puberulous, axillary, slightly longer than the leaves, racemelike, with very short few-flowered branches. Flowers less than 1 in. long, on short pubescent pedicels. Sepals 4, broadly ovate, obtuse, concave, unequal, pubescent outside. Petals 4, a little longer than the sepals, broadly obovate, with 1 or 2 short thickened ridges near the base, glabrous. Stamen 1, inserted on the 4-lobed glabrous disc. Ovary unknown. Fruit oblong, slightly obovoid, obtuse, glabrous, about 1.5 in. long and greenish yellow when ripe, the pulp firm: stone less than 1 in. long. Hook. fil. Fl. Br. Ind. II, 14; Engler in DC. Mon. Phan. IV, 203.

Malacca: Griffith, No. 1100/1. Perak: King's Collector, No. 7539. This species is imperfectly known as yet. The material which I have used in describing it consists of Griffith's specimens on which the species was founded, and they have only male flowers; and of some sent from Perak by the Calcutta Collector which are in fruit and have no flowers. In leaves these two sets agree absolutely, and I have no hesitation in bringing them together as belonging to the same species.

2. Mangifera microphylla, Griff. MSS. ex Hook, fil. Fl. Br. Ind. II, 17. A small tree. Leaves sub-corraceous, elliptic, shortly acuminate, the base narrowed but rounded, both surfaces shining and faintly reticulate; main nerves 10 to 12 pairs, spreading but curving newards,

slightly prominent; length 2 to 4 in., breadth 1 to 2 in.; petiole '25 to '4 in. Panicles in fascicles from the apices of the branches, shorter than the leaves, raceme-like with short few-flowered branches, puberulous. Flowers '2 in. in diam., on short stout pedicels. Sepals 4, broadly ovate, pubescent. Petals 4, twice as long as the sepals, oblong, with 3 distinct vertical ridges. Stamen 1, staminodes absent. Ovary subglobose, puberulous, the style terminal. Drupe "oviform," green. Engler in DC. Mon. Phan. IV, 209.

Malacca: Griffith, Nos. 1102, 1103, (in orchards only.)

Another imperfectly known cultivated species of which only scraps exist in collections.

3. Mangiffra sclerophylla, Hook. fil. Fl. Br. Ind. II, 15. tree; young branches stout, angled, glabrous. Leaves very coriaceous, broadly elliptic, slightly obovate, the apex usually sub-acute but sometimes acute, slightly narrowed to the rounded or sub-cuneate base both surfaces glabrous, the reticulations obscure, the midrib thick; main nerves about 12 pairs, thick, spreading, much curved upwards at the ends, slightly prominent on both surfaces when dry; length 2.5 to 5 in., breadth 1.5 to 2.75 in.; petioles of the upper leaves 25 iu., of the lower ·75 in., all stout. Inflorescence consisting of a terminal fascicle of many spikes, some of them with 1 or 2 branches, longer than the leaves, covered with short coarse tawny pubescence. Flowers 1 in. in diam., each sessile in the axil of a reflexed ovate concave pubescent bractcole longer than itself. Sepals 4, broadly ovate, sub-acute, concave, pubescent outside. Petals 4. about the same size and shape as the sepals, glabrous. Stamen 1; disc fleshy, ovary ovoid. Drupe ovoid, glabrous, about 1.5 in. long when ripe. Engler in DC. Mon. Phan. IV, 205.

Malacca: Maingay, No. 494. Singapore: Ridley, No. 4772.

This is another species that is poorly represented in collections. The leaves are, as Sir Joseph Hooker justly remarks, unlike those of any other *Mangifera*; for they are comparatively broad in proportion to their length. They vary considerably in size and in the length of their petioles.

4. Mangifera maingayi, Hook. fil. Fl. Br. Ind. II, 17. A tree, glabrous in all its parts. Leaves coriaceous, elliptic-oblong, acute or acuminate, the base rounded or cuneate; reticulations on the upper surface not visible and on the lower very slightly so; main nerves 15 to 20 pairs, faint, spreading, curving very little; length 4 to 9 in., breadth 1.5 to 3.5 in.; petiole 8 to 2 in. Panicle quite glabrous, pale green (when dry), pyramidal, equal to or rather exceeding the leaves; the branches spreading, rather slender. Flowers 2 in. in diam. their pedicels slender. Sepals 4, ovate, obtuse. Petals 4, twice as

long as the scpals, oblong, with 3 to 5 confluent vertical ridges. Stamen 1, short; the staminodes minute, tooth-like. Ovary globose; the style short, subulate, sub-terminal. Fruit unknown. Engler in DC. Mon. Phan. IV, 208.

Malacca: Maingay, No. 472.

I have never seen this, and the foregoing description of it is compiled from Sir Joseph Hooker who makes the following note:—-

- "There appear to be two varieties of this in Maingay's Herbatiam; one (called Sapoong or Sampong), with larger leaves not narrowed into the petiole, opaque above, with sunk nerves, tumid between the nerves; the other (marked as truly wild) with brown (when dry) more shining leaves, narrowed into the petiole, more reticulated beneath, and the nerves not sunk; its leaves are like those of M. indica from which its glabrous pedicelled flowers and warted petals at once distinguish it; both differ from M. quadrifida in the inflorescence. The first variety has, according to Maingay, globose green fruit 3-4 by $2\frac{1}{2} \cdot 3$ in."
- MANGIFERA ANDAMANICA, King n. sp. A perfectly glabrous tree; young branches slender and with pale bark. Leaves drying very pale, broadly oblanceolate or obovate-elliptic, the apex rounded or obtuse, gradually narrowed from above the middle to the broad channelled petiole; both surfaces finely reticulate, shining, the lower paler: main nerves 10 or 12 pairs, curving upwards, slightly prominent on the lower surface; length 3.25 to 4.5 in, breadth 1.25 to 2 in.; petiole '5 to '75 in., thickened in its lower half. Panicles terminal, twice as long as the leaves or even three times as long, branching from the base, the branches spreading, lax, the flowers borne at the extremities of the slender ultimate branchlets. Flowers '3 in. in diam., quite glabrous, on pedicels about as long as themselves; bracteoles if any deciduous. Sepals 4, lanceolate, slightly unequal, sub-concave. Petals 4, twice as long as the sepals, ovate-elliptic, with 5 sub-confluent ridges on the lower half of the inner surface. Stumen 1, shorter than the petals, inserted on the inner edge of the fleshy deeply 4-lobed disc. Ovary sub-globose: style sub-terminal, nearly as long as the petals. Drupe elliptic, glabrous, nearly 1.5 in. long when ripe, the pulp thin.

Andaman Islands: King's Collectors.

A very distinct species allied to M. Maingayi, Hook. fil., but with smaller more obtuse leaves and larger flowers than that species.

6. Mangifera longifetiolata, King n. sp. A glabrous tree 40 to 60 feet high; young branches rather stout, with pale brown bark. Leaves coriaccous, oblong to elliptic-oblong, tapering to both ends, the apex shortly acuminate, gradually narrowed in the lower third to the long petiole, both surfaces pale when dry and distinctly reticulate; main nerves 16 to 20 pairs, slender, slightly prominent on both surfaces, spreading, curving, the midrib very prominent and strong on the lower

surface; length 7.5 to 10 in., breadth 2.25 to 3.75 in.; petiole 2 to 4.5 in., thickened and dilated near the base. Panicles quite glabrous, axillary and terminal, branching from the very base; the branches few, ascending, and with short lateral racemoid branchlets bearing 8 to 12 pedicellate flowers near their ends. Flowers 15 in. in diam., their pedicels rather longer than themselves, with 1 or 2 minute bracteoles at their bases. Sepals 4, ovate-lanceolate, rather unequal. Petals 4, larger than the sepals, elliptic, thickened near the base by 3 broad vertical tuberculate ridges. Stamen 1, a little shorter than the petals, inserted on the obscurely lobed cupular fleshy disc, the anther elliptic. Ovary sub-globular with slightly lateral slender style. Drupe unknown.

Perak: at an elevation of about 2,500 feet; King's Collector, No. 7266.

This resembles M. quadrifida, Jack, but the ultimate branchlets of the panicle are longer, the flowers are more numerous and are racemose instead of being cymose as in M quadrifida. The petioles moreover are longer in this, and are dilated near the base; the main nerves of the leaves are more prominent and the reticulations are larger and more distinct, while the midrib is much stouter and more prominent on the lower surface. This grows at higher elevations than M. quadrifida. In the great length of its petioles this resembles M. longipes, Griff.; but that has 5-merous flowers, whereas flowers of this are 4-merous.

7. Mangifera Quadrifida, Jack in Roxb. Fl. Ind. ed. Carey, II, 440. A tree 40 to 60 feet high, all parts quite glabrous. Leaves coriaceous, elliptic-oblong or oblong-lanceolate, tapering from about the middle to the sub-acute apex and much attenuate base; reticulations faint on both surfaces, but specially on the upper: main nerves 16 to 18 pairs, spreading, curved, slightly prominent; length 5 to 7 in., breadth 1.75 to 2.5 in.; petiole .75 to 2.5 in.; petiole .75 to 1.2 in. Panicles from the uppermost axils, often crowded or terminal, exceeding the leaves, not pedunculate, branching from near the base, the branches semi-erect, with very short lax 3-flowered cymose branchlets. Flowers 15 in. in diam., on pedicels about their own length. Sepals 4, broadly ovate, obtuse, minutely puberulous, spreading. Petals 4, twice as long as the sepals, elliptic, sub-acute, glabrous, with 3 confluent vertical ridges in the lower half, the middle one thickened at the apex. Stamen 1, from the inner side of one of the four deep lobes of the fleshy disc, shorter than the petals, the anther small. Ovary broadly ovoid, glabrous; the style terminal, as long as the stamen, thickened at the base. Staminodes none. Drupe roundish (becoming very dark-coloured, Jack). Wall. Cat. 8489; Hook. fil. Fl. Br. Ind. II, 16; Eugler in DC. Mou. Phan. IV, 206.

Penang: Jack. Malacca: Maingay, No. 468. Perak: King's Collector, Nos. 2693, 8444.

I have not seen fruit of this, and nothing has been recorded about it except Jack's statement that is roundish and becomes very dark-coloured. The long, laxly-branched, quite glabrous panicles make the species easy of recognition.

8. Mangifera Pentandra, Hook. fil. Fl. Br. Ind. II, 14. A tree. Leaves coriaceous, oblong or oblong-lanceolate, sub-acute, the edges sub-undulate, the base slightly cuneate or almost rounded, the nerves as in M. indica, but the reticulations between them finer and more distinct on both surfaces; length 4 to 6 in., breadth 1.5 to 2 in.; petioles 4 to 6 in. Panicles as in M. indica, but more densely hairy. Sepals 5, broadly ovate, obtuse, coarsely pubescent outside. Petals slightly longer than the sepals and similar in shape, 3-nerved in front to the middle, glabrous. Stamens 5, much shorter than the petals, unequal, seated upon the thick lobed disc, all fertile. Ovary smooth, style sub-terminal. Fruit unknown. Engler in DC. Mon. Phan. IV, 198.

Malacca: Griffith, No. 1095: Maingay (Kew Distrib.), No. 471.

This species is very imperfectly known. Both in its leaves and inflorescence it much resembles M. indica, L.; but the flowers have five stamens, the sepals are broader and more coarsely pubescent, the petals are shorter and are situated nearer the edge of the disc. The bases of the leaves are also less cuneate than in M. indica. According to Maingay, the petals of this are yellowish-white with yellow-brown edges. The Malay name of it is, he states, "Man ploni."

9. Mangifera indica, Linn. Spec. Pl. 290. A spreading tree 20 to 30 feet high, all parts except the inflorescence glabrous. Leaves coriaceous, narrowly oblong, elliptic-oblong or oblong-lanceolate, usually acute or acuminate, rarely sub-acute, the margins sometimes undulate. the base cuneate; main nerves 12 to 20 pairs, spreading, curving, slightly prominent on both surfaces when dry; length 5 to 10 in, breadth 1.5 to 3 in.; petiole .5 to 1 in. or even 2 in. Panicles longer than the leaves, axillary or terminal, with many spreading branches, many-flowered, minutely tomentose or pubescent, rarely glabrescent; bracteoles ovate, small. Flowers 2 in. in diam., monœcious, on short thick pedicels, yellowish. Sepals ovate, concave, pubescent outside, shorter than the petals. Petals oblong, sub-acute, glabrous, the inner face with 3 stout nerves. Stamen 1, rising from between two of the 5 lobes of the fleshy disc, filament subulate. Ovary obliquely ovoid, glabrous. Drupelarge, fleshy, obliquely pyriform or sub-ovoid, sub-compressed, varying in length from 3 or 4 in. and in some of the cultivated forms as much as 12 inches; stone with a fibrous coat, very hard. DC. Prod. II, 63: Blume Mus. Bot. Lugd. Bat. I, 193: Roxb. Fl. Ind. I, 641; W. and A. Prod. 170; Beddome Fl. Sylv. t. 162; Wall. Cat. 8487 (excl. D. G. and I.); Dalz. and Gibs. Bomb. Flor. 51; Bot. Mag. t. 4510; Brandis For-Flor. 125; Hook. fil. Fl. Br. Ind. II, 13: Kurz For. Flora Burma, I, 304; Eugler in DC. Mon. Phan. IV, 199. M. domestica, Gaertn. Fruct. t. 100.—Rheede Hort. Mal. IV, t. 1, 2.

In all the Provinces, but planted; truly wild only in hot valleys in the mountain ranges of British India: known as the "Mango" to Europeans in the British India, the commonest vernacular Indian name being Am. An immense number of varieties are in cultivation.

10. Mangifera oblongifolia, Hook. fil. Fl. Br. Ind. II, 16. A very large and perfectly glabrous tree; young branches stout. Leaves very coriaceous, oblong-elliptic, or linear-oblong, obtuse or sub-acute, the margins sub-undulate, the base sub-cuneate; main nerves 18 to 25 pairs, spreading, curved, reticulations faint on the upper and obsolete on the lower surface; length 8 to 12 in., breadth 1.5 to 2.5 in.; petiole 1.25 to 2 in. Panicle large, the branches widely spreading, bi- or trichotomously laxly-branched. Flowers .25 in. in diam., on pedicels .15 to .25 in. long, stout. Sepals 5, ovate, obtuse, veined. Petals 5, twice as long as the sepals, elliptic-oblong, with 3 to 5 short vertical ridges confluent at the base into a tubercle. Stamens 5, all bearing anthers, but only one fertile longer than the others. Ovary sub-globose, style sub-terminal. Fruit ovoid, dull green, 4 in. long. Engler in DC. Mon. Phan. IV, 16.

Malacca: Griffith, No. 1101; Maingay, No. 470. Cultivated.

A species, according to Maingay, cultivated under the name of the "Quenee Mango."

11. Mangifera Longipes, Griff. Notul. IV, 419. A tree: young branches slender, glabrous. Leaves thinly coriaceous, oblong or ellipticoblong, shortly acuminate, the edges minutely sub-undulate, the base narrowly cuneate, both surfaces shining; main nerves 16 to 20 pairs, sub-horizontal, thin but distinct on both surfaces (some of the intermediate towards the apex almost as distinct): length 5 to 8 in., breadth 1.5 to 2 in.; petiole '75 to 1.75 in., slender. Panicles terminal, longer than the leaves, slender, with lax' spreading branches, quite glabrous. Flowers nearly '2 in. in diam., in ultimate cymules, on pedicels longer than themselves. Sepals 5, ovate, acute, with membranous edges and a few hairs near the midrib on the back. Petals 5, longer than the sepals, linear-oblong, blunt, the apices reflexed, the base with a single ridge branching upwards. Stamen 1, longer than the petals, staminodes several. Ovary broadly ovoid, sub-compressed: style sub-lateral, as long as the petals. Fruit unknown. Hook. fil. Fl. Br. Ind. II, 15; Eugler in DC. Mon. Phan. IV, 201.

Malacca: Griffith, No. 1096; Maingay, No. 467.

12. Mangifera Gracilipes, Hook. fil. Fl. Br. Ind. II, 16. A large perfectly glabrous tree, young branches slender. Leaves sub-coriaceous, small, elliptic-lanceolate, acuminate, shining, the edges undulate, the base narrowly cuneate; main nerves 10 or 12 pairs, slightly prominent, the veins and reticulations obscure; length 3 or 4 in., breadth 1 to 1.5 in.; petiole .75 to 1 in., very slender. Panicles quite glabrous, slender, longer than the leaves, terminal, with numerous long very slender raceme-like branches bearing numerous short lateral branchlets. Flowers about .2 in. in diam., their pedicels slender and about as long as themselves. Sepals 5, ovate, sub-acute, puberulous. Petals 5, lanceolate, much longer than the sepals, with 3 to 5 prominent vertical ridges. Stamen 1, shorter than the petals; rudimentary stamens 4, subulate. Ovary sub-globose: style long, lateral. Engler in DC. Mon. Phan. IV, 203.

Malacca: Maingay, No. 475.

As yet this is known only by Maingay's specimens, not one of which bears fruit.

13. Mangifera odorata, Griff. Notul. IV, 417. A tree, all parts glabrous. Leaves coriaceous, oblong or elliptic-lanceolate, acute or acuminate, both surfaces reticulate but especially the lower; main nerves about 20 pairs, spreading, very prominent beneath: length 6 to 12 in., breadth 2 to 4 in.; petiole 1.25 to 1.75 in., much thickened in the lower half. Panicle longer than the leaves, stout, glabrous. Flowers about 25 in. in diam., flesh-coloured. Sepals 5, ovate-oblong. Petals 5, three times as long as the sepals, oblong, greenish suffused with red, with 3 confluent ridges, the apices reflexed. Perfect stamens sometimes 2, nearly as long as the petals; the imperfect ones shorter, subulate and capitate. Ovary ovoid, glabrous, tapering into the long filiform sub-lateral style. Drupe oblong.

Malacca: Griffith, No. 1098 - DISTRIB. Java; Zollinger, No. 430.

The few specimens of this that I have seen are very poor. Griffith (quoted by Sir J. D. Hooker in F. B. Ind. l. c.) gives the following account of the fruit. "Drupe oblong, stinking, yellow-green, with yellow spots, filled with a sticky gum; flesh yellow, fibrous, sweet, not turpentiny; stone compressed, fibrous; cotyledons rugose, equal at the base, one overlapping at the top." Sir Joseph adds the following note. "Malay name "Koeene" or "Kohini," according to Griffith, which is the name Maingay gives to M. oblongifolia (a totally different plant). This much resembles M. Parih, Miq., of Java, which has a more effuse panicle with long tertiary branchlets and very long pedicels."

14. Mangifera foetida, Lour. Fl. Cochinch., 160. A tree 60 to 80 feet high; young branches stout, the bark pale when dry. Leaves very

coriaceous, elliptic-oblong to broadly-elliptic, sometimes slightly obovate, obtuse or sub-acute, the base slightly cuneate, both surfaces pale when dry and with the reticulations indistinct or obsolete: main nerves 16 to 18 pairs, bold, sub-horizontal; length 8 to 12 in., breadth 3.5 to 6 in.; petiole 75 to 2:25 in., stout especially in its lower half. Panicles terminal or axillary, pedunculate, as long as or longer than the leaves, puberulous or glabrous, blood-red when fresh, black when dry; the branches stout, sub-erect and bearing scattered cymose branchlets, bracteoles minute. Flowers :35 in. in diam., pinkish; pedicels very short, Sepals 5, thick, ovate-lauceolate, minutely bracteolate at the base. sub-acute, glabrous. Petals 5, linear-oblong, acute, twice as long as the sepals, reflexed from about the middle, with an elongated 2- or 3-fid thickening near the base and a short filiform basal claw. Stamens 5, but only I perfect and nearly as long as the petals, the others shorter, unequal and imperfect. Disc cylindric. Ovary sub-ovoid, glabrous; stule slender, lateral. Drupe elliptic to globose, varying in form, oblique, green, 3 or 4 in. long. Roxb. Fl. Ind., ed. Carey, II, 440: Griff. Notul. IV, 419; DC. Prod. II, 63; Blume Mus. Bot. Lugd. Bat. I, 198; Miq. Fl. Ind. Bat. Vol. I, pt. 2, 632; Hook. fil. Fl. Br. Ind. II. 19; Kurz For. Flora Burma, I, 305; Engler in DC. Mon. Phan. IV, 212. M. Horsfieldi, Miq. Fl. Ind. Bat. Vol I, pt. 2, 632.

Malacca, Penang, Singapore, and probably in all the other Provinces except the Andamans and Nicobars.—DISTRIB. Java, Sumatra.

I extract the following note from Sir Joseph Hooker's Flora of British India. "Drupe variable in form, not compressed, oblique, green, smooth, very fetid; flesh yellow, thick; stone almost 2-edged, chartaceous, fibrous; cotyledons equal, auricled at the base; radicle short. (Griffith.)—Maingay describes the fruit as coarse-flavoured, and not unlike Lanjoot (M. lagenifera), stringy. Malay name Bachang or Bachong. Rumph and Loureiro describe the drupe as hairy, but no one else does so; possibly the fibres of the stone are alluded to by these authors."

15. Mangifera fragrans, Maingay MSS. ex Hook. fil. Fl. Br. Ind. I, 18. A tree everywhere glabrous; young branches thick, black when dry. Leaves coriaceous, narrowly linear-oblong or linear-lanceolate, acute, acuminate or rounded at the apex, the edges undulate, the base acute, abruptly contracted into the very slender petiole, both surfaces conspicuously reticulate; main nerves 25 to 35 pairs, slender, almost horizontal; length 6 to 10 in., breadth 1 25 to 1 5 in.; petiole 1 to 2 in. Panicle longer than the leaves, on a long peduncle, spreading; its branches thick, glabrous, black when dry. Flowers nearly 3 in. long, erect, their pedicels thickened at their apices. Sepals 5? unequal,

ovate-lanceolate. Petals 5? narrowly linear-oblong, erect below but sharply reflexed about the middle, with 1 to 3 vertical ridges. Stamens 5, one much longer than the others whose anthers are imperfect (Hooker); filaments very slender, shorter than the lateral capillary style. ("Drupe obliquely broadly oblong-globose: the flesh yellow, acid and terebinthine: stone thin, fibrous, the testa coriaceous." Maingay.)

Malacca: Maingay, No. 473.

Concerning the species, Sir Joseph Hooker remarks in a note (l. c. 18) as follows:—This in foliage approaches very closely Blume's M. macrocarpa of Java, which has still narrower leaves with crimped edges, 40 pairs of nerves, and a bitter-sweet fruit as large as a child's head. Dr. Engler believes that this is M. macrocarpa Blume and (Mon. Phan. IV, 211) reduces it to that species. The very long narrow crispededged leaves and large fruit distinguish it.

16. Mangifera Lagenifera, Griff. Notul. IV, 414, t. 567, fig. 3. A tree 50 to 80 feet high; the young branches stout, pale when dry. Leaves very coriaceous, oblanceolate or oblong-lanceolate, obtuse or rounded, gradually narrowed below the middle to the stout petiole; both surfaces dull when dry, not reticulate, the 16 to 20 pairs of straight spreading main nerves very faint; length 3 to 6 in., breadth 1 to 1.75 in.; petiole 5 to 9 in., flattened. Panicle puberulous, (purple in colour when fresh) much exceeding the leaves, on a stout pedancle; the branches lax, ascending, and bearing pedunculate cymose branchlets. Flowers 35 in. in diam., on pedicels shorter than themselves; bracteole large, broad, hooded. Sepals 5, (often 6) spreading, broadly ovate, pubescent outside. Petals 5, (often 6) two or three times as long as the sepals, erect, oblanceolate or sub-spathulate, obtuse, puberulous outside, slightly concave and thickened in the middle, purple. Stamens 5 or 6, all perfect, nearly as long as the petals; anthers ovate, short: filaments long, slender. Disc slender, cylindric. Ovary obliquely obovoid, glabrous; the style as long as the stamens, sub-terminal. (Drupe pyriform, pale green with a pink blush; pulp livid or of a purplish flesh-colour: stone fibro-coriaceous, adherent to the membranous texta; radicle basal, very large," Maingay) length 4.5 in., breadth 2.5 in.

Malacca: Griffith, No. 1104; Maingay, No 469.

The description of the fruit above given was taken by Sir Joseph Hooker from Maingay's notes, and has been by me copied from the Flora of British India. Concerning the fruit Sir Joseph has the following note on Griffith's account of it which I quote verbatim from Fl. Br. Ind. II, 18. "Called Lanjoot by the Malays, according to Maingay and Griffith. The latter describes the drupe as smooth, glaucescent,

fleshy, fetid, exuding a black varnish, traversed by innumerable fibres; stone ovate-lanceolate, fibro-coriaceous. Seed erect, adhering to the black tegument on the one side, on the other smooth; cotyledons with one half the surface smooth, the other wrinkled. Maingay describes the disc as hemispherical, but I do not find it so."

17. MANGIFERA KEMANGA, Blume Mus. Bot. Lugd. Bat. I, 202. A large tree with very stout young branches. Leaves crowded at the apices of the branches, coriaceous, sub-sessile, oblanceolate or obovateoblong or enneate-oblong, sub-acute or shortly and obtasely acuminate, the edges sub-undulate, gradually narrowed from below the middle to the base, glabrous and the reticulations obsolete on both surfaces: main nerves 20 to 22 pairs, slender but distinct on both surfaces, the midrib also broad and distinct; length 9 to 15 in., breadth 2.5 to 4 in.: petiole sometimes '1 to '3 in. but usually absent. Panicle large, terminal, much longer than the leaves, 20 to 30 in. long, on a stout angled peduncle covered by minute white hairs with a few longer brown ones intermixed: branches of the panicle angled, spreading and dividing, the flowers borne in cymules at the ends of the branchlets; bracteoles broadly ovate, concave, pubescent, deciduous. Flowers 25 in. long, of a rich pinkish purple, their pedicels short. Sepals 5, erect, linear-lanceolate, thick, concave, pubescent outside, glabrous inside. Petals 5, less than twice as long as the sepals, erect, linear-lanceolate, concave, thick. the edges thickened and undulate, glabrous, with a single mesial ridge in front. Stamen 1, shorter than the petals: the anther ovate, short. Disc. narrow, embracing the base of the sub-globose ovary; style sublateral, filiform: stigma small, terminal. Drupe (fide Griffith) oblong, a little gibbous at the base, obliquely emarginate near the apex, of a brown colour and with the smell of a dorian or mango: flesh and juice copious, fibres very abundant. Stone in outline lanceolate, rather compressed. not woody but fibro-coriaceous, seed erect. M. policarpa, Griff. Notul. IV, 416, t. 567, fig. 2; Hook, fil. Fl. Br. Ind. II, 20; Engler Mon. Phan. IV. 213.

Malacca: Griffith. Sumatra: Forbes, No. 3198.

This is a species closely allied to *M. caesia*, Jack, but the leaves of this are usually quite sessile and the panicle is greatly larger. Griffith's Malacca specimens consist of leaves only, his description extends to the fruit, but not to the flowers. I have described the flowers from Forbes's Sumatra plant, the leaves of which appear to me to resemble perfectly those of Griffith's Malacca specimens; and they agree to the minutest detail with Blume's full description. The vernacular name in Malacca is, according to Griffith, Camang which according to Blume changes on the Archipelago to Kemang, Kamang and Kamanga.

18. Mangifera Caesia, Jack in Roxb. Fl. Ind. ed. Carey, II, 441. A large tree; young branches stout, rather rough from the cicatrices of fallen leaves. Leaves thickly coriaceous, broadly larecolate or ellipticoblong, shortly and bluntly acuminate, narrowed from about the middle to the short broad petiole; main nerves 20 to 25 pairs, thin, spreading, curving, the midrib stout and the reticulations obscure on both surfaces; length 6 to 12 in., breadth 2 to 3.5; petiole .35 to .5 in. long. I'anicle large, erect, terminal, longer than the leaves, on a stout peduncle, minutely tawny-tomentose and of a glaucous reddish-colour: its branches numerous, spreading, dividing and bearing the flowers near their extremities in densely crowded cymules. Flowers 3 in. long, on stout pedicels shorter than themselves with a broad elliptic bractcole at the base of each. Sepals 5, lanceolate, sub-acute, crect, pubescent. Petals 5, twice as long as the sepals, adnate to the disc, linear erect, glabrous, with one central ridge, concave. Stamen 1, shorter than the petals, the anther short, staminodes very minute. Disc small, sub-5-lobed. Ovary obliquely ovoid; style sub-terminal. Drupe ohovateoblong, reddish-white. Griff. Notul. IV, 415; Hook, fil. Fl. Br. Ind. II, 19; Engler Mon. Phan. V, 213.

Malacca: Griffith, No. 1100; Maingay, No. 465.

19. Mangifera superba, Hook, fil. Fl. Br. Ind. II, 19. A very large tree: the young branches three-quarters of an inch thick. Leaves large, very coriaceous, cuneate-oblanceolate, sub-acute, the margins slightly undulate, gradually narrowed from the upper third to the short flattened stout petiole; both surfaces hard and quite glabrous, not reticulate; the midrib very stout, flattened on the upper but prominent on the lower surface; main nerves 30 to 35 pairs, spreading, not very prominent: length 10 to 16 in., breadth 3 to 5; petiole very stout, from 5 to 1 in. long. Panicle terminal, much longer than the leaves, tawny-pubescent, on a very stout peduncle with many woody lanceolate bracts at its base; its primary branches few, sub-erect, with short branchlets crowded near the apex, the flowers densely crowded near the apices of the branchlets; bracts numerous, large, broadly lanceolate, concave, pubescent. Flowers .75 in. long, lilac, their pedicels very short. Sepals 5, ovate-lanecolate, pubescent, concave, 35 in. long. Petals 5, twice as long as the sepals, adnate to the cylindric disc, lanceolate, acuminate, recurved, veined, with a thickened central ridge on the lower half. Stamen 1, bearing a perfect anther, the others with imperfect small anthers, the filaments of all subequal. Ovary obliquely ovoid, tapering into a slender sub-terminal elongate style; ovule horizontal, laterally attached. Engler in DC. Mon. Phan. II, 214.

Malacca: Maingay, No 476.

This is at once distinguished in the genus by its large flowers and prominently bractcolate peduncles. It has hitherto been collected only in Malacca, and only by Maingay. The great massing of semi-ligneous bracts at the base of the peduncle is quite unique in the genus.

Besides the foregoing there are in the Calcutta Herbarium flowering specimens of a Mangifera collected by Mr. L. Wray at an elevation of 3,400 feet on Gunong Batu Patch in Perak, (Herb. Wrav. No. 982). These have good flowers, but not one of them is in fruit. The species is 5-merous, and is evidently allied to M. Griffithii, Hook. fil. and to M. longipes, Griff. From the former of these it is distinguished by its glabious -- not puberulous -- panicles, and more laxly reticulate leaves with shorter petioles. From M. longipes it differs in having shorter and more condensed panicles and smaller flowers. There are also fruiting specimens of a species gathered by the Calcutta Garden Collector, the late Mr. H. Kunstler, in Perak at an elevation of 500 to 800 feet (King's Collector, No. 7744); but none of them has a single flower on it. The fruit when ripe is described by Mr. Kunstler as yellowishgrey in colour, measuring from four to five inches in length, and about half as much in diameter. The leaves are oblong, tapering to each end, finely reticulate and with 13 to 15 pairs of faint ascending nerves. It is described as a tree 50 to 70 feet in height.

4. ANACARDIUM, Rottb.

Shrubs or trees. Leaves alternate, petioled, simple, quite entire. Panicles terminal, bracteate. Flowers polygamous. Calyx deeply 5-partite; the segments narrow, erect, imbricate, deciduous. Petuls 5, linear-lanceolate, recurved, imbricate. Disc filling the base of the calyx, erect. Stamens 8-10, all or some fertile; filaments connate and adnate to the disc. Ovary obliquely obovoid or obcordate; style filiform, excentric, stigma minute; ovule 1, semi-pendulous by a funicle from the side of the base of the ovary. Nut kidney-shaped, seated on a large pyriform fleshy body formed of the enlarged disc and top of the peduncle; pericarp cellular and full of oil. Seed kidney-shaped, ascending; testa membranous, adherent; cotyledons semi-lunar; radicle short, hooked.—Distrib. A small tropical American genus, of which one species is naturalised in Asia.

ANACARDIUM OCCIDENTALE, Linn. Sp. Pl. 548. A small tree. Leaves coriaceous, glabrous, obovate, obovate-oblong or elliptic; the apex obtuse, rounded or retuse, the edges entire; the base cuneate or sub-cuneate, rarely rounded; main nerves 10 to 12 pairs, spreading, rather prominent beneath; length 4 to 9 in., breadth 3 to 5 in.; petiole 5 to 75 in. Panicles terminal, longer than the leaves, on peduncles which lengthen

with age, puberulous toward the apex, the branches cymose; the flowers at the apices, '5 in. long, the pedicel shorter; bract ovatelanceolate, nerved, puberulous. Sepals lanceolate. Petals longer than the sepals, linear-lanceolate, deflexed from the middle. Stamens about 9, one longer than the others. Fruit 1 in. long; its peduncle large, fleshy, dark-coloured. Jacq. Ann. I, 121, t. 35; DC. Prod. II, 62; Roxb. Fl. Ind. II, 312; Wall. Cat. 990; Wight and Arn. Prodr. I, 168; Grah. Cat. Bomb. Pl. 40; Dalz. and Gibs. Bomb. Flor. Suppl. 18; Griff. Notul. IV, 408, t. 565, f. 3 e. f.; Hook. fil. Fl. Br. Ind. II, 20; Bedd. Fl. Sylv. t. 163; Kurz For. Flora Burma, I, 310; Engler in DC. Mon. Phan. IV, 219.—Rheede Hort. Mal. III, t. 54.

In all the Provinces, but always near villages and probably planted. A native of tropical America.

5. GLUTA, Linn.

Trees with caustic juice. Leaves crowded at the ends of the branchlets, short-petioled, simple, oblong, coriaceous. Panicles axillary and terminal. Flowers small, hermaphrodite. Calyx spathaceous, bursting irregularly, caducous. Petals 4-6, adnate to the disc, imbricate. Disc elongate, rarely short. Stamens 4-6, inserted on the disc, filaments capillary. Ovary sessile on the disc or stipitate, oblique, 1-celled; style lateral, filiform, stigma simple; ovule solitary, pendulous from a basal funicle. Drupe sub-ligneous, stalked, dry, more or less irregularly globose, irregularly tubercled or ridged; the endocarp coriaceous, connate with the testa, juicy: cotyledons fleshy, large, connate: the radicle short and incurved.—Distrib. About six species all either Malayan or Burmese.

Calyx only about one-fourth of the length of the petals, glabrous; petioles short ('3 to '6 in. long) 1. G. Benghas.

Calyx half as long as the petals.

Calyx glabrous; petioles slender, '6 to 1 in., long, ovary obliquely ovoid ... 2. G. elegans.

Calyx tomentose; ovary obliquely sub-reniform-orbicular, tubercled, glabrous; petioles very short ('1 to '35 in.) ... 3. G. coarctata.

Calyx pubescent; ovary obovoid-rotund, tomentose; petioles '6 or '7 in. broad, channelled ... 4. G. Wrayi.

1. GLUTA BENGHAS, Linn. Mant. 293. A tree. Leaves oblanceolate-oblong, the apex broad and rounded, rarely with a blunt apiculus; gradually narrowed in the lower half to the short narrow channelled petiole; both surfaces shining and reticulate; main nerves 18 to 20

pairs, spreading, not very prominent; length 4 to 7 in., breadth 1 6 to 2 ·25 in.; petiole ·3 to ·6 in. Panicles axillary, when in flower shorter than the leaves, when in fruit often longer, puberulous, the branches divaricate and corymbose, pedicels shorter than the buds. Calyx glabrous, only about one-fourth as long as the petals. Petals elliptic-lanceolate. Stamens 5, about half as long as the petals, the gynophore shorter than the stamens. Ovary obliquely globosely sub-reniform, the style sub-lateral, 2 imperfect ovaries sometimes present. Drupe irregularly globose or sub-reniform, much tuberculate, furrowed on one side, about 1 ·5 in. in diam. Willd. Sp. Pl. I, 1120; DC. Prod. I, 501; Blume Bijdr. 1159; Mus. Bot. Lugd. Bat. I, 182, t. 39. G. Renghas, Engler in DC. Mon. Phan. IV, 226, t. 6. Stagmaria verniciflua, Jack in Malay Misc. ex Hook. Comp. Bot. Mag. I, 267.

Pahang: Ridley, No. 1228.

Distributed over the whole Malayan Archipelago and known to the Malayas as *Renghas*, which was no doubt the name that Linneus intended to use as the specific name, although it appears in his Mantissa as *G. Benghas*. The copious resin of this tree is acrid, but it forms the basis of an excellent varnish which is exported to China and Japan.

2. GLUTA ELEGANS, Kurz For. Flora Burma, I, 310. A small tree. every part except the inflorescence glabrous: young branches slender, with cinereous bark. Leaves coriaceous, oblong-lanceolate or ellipticlanceolate, shortly and obtusely acuminate, the base cuneate; upper surface shining, the lower faintly reticulate and sub-glaucous; main nerves 10 to 14 pairs, spreading, faint or slightly prominent on the lower surface: length 3 to 6 in, breadth 1 to 2 in.; petiole '6 to 1 in., slender, thickened at the base. Panicles much shorter than the leaves, mostly terminal, with alternate sub-corymbose branches each with 5 to 9 pedicellate flowers, bracteole linear. Flowers nearly 5 in, long. Calyx tubular, split on one side, 4-nerved, glabrous, scarlet, the apex with 2 teeth. Petals 4 or 5, twice as long as the calyx, linear-lanceolate, blunt, spreading. Stamens 4 or 5, as long as the petals or longer. Gynophore half as long as the corolla. Ovary obliquely ovoid. Drupe oblong, gibbous, glabrous, '75 in. long when dry, the scar of the style nearer the base than the apex. Hook. fil. Fl. Br. Ind. II, 22; Engler in DC. Mon. Phan. IV, 225. Syndesmis elegans, Wall. in Roxb. Fl. Ind., ed. Carey, II, 315; Cat. No. 1003.

Penang: Porter, (Wall. Cat. 1003 and 9049). King: King's Collector, No. 1366. Malacca: Maingay, No. 481. Perak: King's Collector, No. 4913.

Var. Helferi, Hook. fil. l. c. leaves linear-oblong, obtuse, nerves oblique.

Tenasscrim and Andamans: Helfer, Nos. 1117 and 1118.

3. GLUTA COARCTATA, Hook. fil. Fl. Br. Ind. II, 22. A small tree, all parts except the puberulous inflorescence glabrous. Leaves thinly coriaceous, often recurved and conduplicate, obovate-oblong, oblanccolate-oblong or oblong, obtuse or sub-acute, narrowed in the lower third to the short stout petiole, occasionally minutely cordate; the edges often undulate: both surfaces shining and reticulate; main nerves 13 to 20 pairs, spreading, faint on both surfaces; length 5 to 9 in., breadth 1.75 to 3 in.; petiole 1 to 35 in., stout. Panicles axillary, shorter than the leaves, pedunculate, tawny-puberulous, with a few corymbose branches, each with 3 to 5 shortly pedicelled flowers nearly A in, long when fresh. Calyx half as long as the petals, shortly bilobed, cinereous-tomentose. Petals 5, broadly oblanceolate, veined, puberulous outside. Stamens 5, shorter than the petals, the gynophore much shorter. Ovary obliquely sub-reniform, orbicular, rugulose, glabrous, the style lateral. Drupe sub-globose, apiculate, with an irregularly tuberculate ridge round the base, the sides also irregularly tubercle-ridged; the epicarp leathery; the mesocarp white, fibrous and spongy; the endocarp coriaceous, adnate to the ercct seed. Cotyledons unequally sub-hemispheric, fleshy, about 1.5 in. long when fresh. Engler in DC. Mon. Phan. IV, 227, (excl. syn. G. velutina Bl.)

Malacca: Griffith, No. 1120. Perak: Scortechini, No. 1375. Johore: King and Hullett.—Distrib. Sumatra.

The Bornean species which Blume (Mus. Bot. Lugd. Bat. I, 183) names G. velutina is known only by his description which consists of the following six words "paniculae ramis patentibus calycibusque sericeo velutinis." It is considered by Dr. Engler to be identical with this: but Blume's description, short as it is, appears to me to negative the suggestion.

4. GLUTA WRAYI, King n. sp. A tree, all parts except the inflorescence glabrous. Leaves thickly coriaceous, elliptic, sub-acute, the edges sub-undulate, narrowed from about the middle to the broadly channelled petiole, both surfaces faintly reticulate when dry; the main nerves 12 to 14 pairs, spreading, quite obsolete on the upper surface, faint on the lower; length 4 to 6.5 in., breadth 1.6 to 2.5 in.; petiole 6 or 7 in. Panicles in the upper leaf-axils only, much shorter than the leaves, shortly pedunculate, densely and minutely pubescent, the branches spreading; the flowers numerous, 4 in. long, crowded towards the apices; pedicels shorter than the buds. Calyx pubescent outside, about half as long as the petals. Petals 5, narrowly oblong-lanceolate, rather blunt at the apex, the base clawed, puberulous outside, glabrescent inside. Stamens 5, longer than the petals, authors short, filaments thickened

towards the base: ovary obovoid-rotund, tomentose; the style lateral, elongate. Fruit unknown.

Perak: Wray, No. 2290.

This differs from *G. coarctata*, Griff. in its longer leaf-pctioles, shorter panicles, broader pctals and sub-obovate-rotund, tomentose, ovary. It has been hitherto collected only once by Mr. Wray: fruit is as yet unknown.

Note.—Kurz (Pegu Report 41, and in Journ. As. Soc. Bengal for 1876, pt. 2, p. 210) refers (under the name G. petiolata) to a tree which he had seen common on the shores of the Andamans, but of which he had collected neither flowers nor fruit. The specimens to which he has attached this name in the Calcutta Herbarium do not, however, appear to me to be those of a plant of this genus.

6. MELANORRHEA, Wall.

Trees with much oleo-resinous juice. Leaves alternate, simple, quite entire, coriaceous. Panicles axillary or terminal. Flowers rather large, hermaphrodite. Sepals 5, united, calyptriform or collar-like, deciduous. Petals 5-8, linear-oblong, imbricate, much enlarged in fruit. Disc hemispheric or columnar. Stamens 5-10, or very numerous, inserted on the disc; filuments slender. Ovary stalked, lenticular, oblique, 1-celled; style sublateral, stigma simple; ovule 1, pendulous from a basal funicle. Fruit dry, subsessile, or on a long pedicel rising from the stellately-spreading persistent petals, globose, coriaceous. Seed subglobose or oblong; testa papery; cotyledons thick, plano-convex; radicle ascending. A Malayan genus of about 9 species.

Sect. I. Eumelanorrhoea: petals accrescent in the fruit.

Calyx spathaceous and falling off like a calyptra.

Stamens 5.

Bracts if any small and deciduous.

Leaves broadly elliptic, the lower surface with many very minute

hairs and numerous dots ...

Leaves obovate-elliptic, glabrous on both surfaces, not dotted ...

Bracts large and persistent, embracing the flower buds

Stamens 10

Calyx withering and remaining as a loose 3-toothed collar round the pedicel ...

Sect. II. Apterae: petals not accrescent.

Petals oblanceolate, leaves 6 to 15 in. long Petals elliptic, leaves 4 or 5 in. long ...

1. M. Maingayi.

2. M. Wallichii.

3. M. Woodsiana.

4. M. Curtisii.

5. M. torquata.

6. M. aptera.

7. M. inappendiculata.

The characters of the genus Melanorrhoa, as defined by Wallich its founder, were modified, as regards the number of stamens, by Sir Joseph Hooker in the Flora of British India, in order to admit the pentamerous species M. Maingayi and M. Wallichii. I have ventured still further to modify them in two points, viz., the calyptrate nature of the calyx, and the accrescence and persistence of petals as wings in the fruit. In the species which I have here named M. torquata, the calyx, instead of slipping off over the apex of the flower as a calyptra, drops downwards and forms a loose collar hanging round the pedicel. And, in the two species which I have named M. aptera and M. inappendiculata, the petals are deciduous and do not persist as wings to the fruit. But, even after these modifications, there remain a sufficient number of characters by which Melanorrhoa may be distinguished from its nearest ally Swintonia.

1. MELANORRHEA MAINGAYI, Hook. fil. Fl. Br. Ind. II, 25. A tree 80 to 100 feet high: the young branches rather slender, their bark when dry pale brown, at first puberulous afterwards glabrous. Leaves coriaceous, broadly elliptic, the apices rounded or obtuse, the base very slightly cuneate, the edges sub-undulate; both surfaces reticulate. shining, the upper glabrous, the lower with a few very minute hairs and many dots; main nerves 12 to 16 pairs, sub-horizontal, prominent on both surfaces but especially on the lower: length 3.5 to 6 in., breadth 2 to 3 in.; petiole 1 to 1.25 in. Panicles terminal and axillary, slender, two or three times as long as the leaves, tawny-pubescent especially towards the extremities, their branches few and sub-erect. the ultimate branchlets few-flowered. Flowers 5 in. in diam., on slender pedicels; buds elliptic, acute, pubescent. Petals lanceolate, pubescent. Stamens 5; the filaments slender, pubescent above the middle. Disc elevated. Ovary tomentose. Fruit oblong, obtuse, about '5 in. long. glabrescent; the enlarged petals at its base coriaceous, veined, linearoblong, the gynophore very short. Engler in DC. Mon. Phan. IV, 235.

Malacca: Maingay, Nos. 482; 485; Derry. Perak: Scortechini, No. 1719: King's Collector, No. 7788. Singapore: Ridley, No. 4780.

2 Melanorrhea Wallichii, Hook. fil. Fl. Br. Ind. I, 25. A very large tree; the young branches slender, glabrous. Leaves coriaceous, obovate-elliptic, the apex obtuse or rounded, the base slightly cuneate and somewhat oblique; both surfaces glabrous and shining, the lower reticulate, the upper obscurely so: main nerves 10 or 12 pairs, sub-horizontal, not very prominent; length 3.5 to 8 in., breadth 2 to 4 in.; petiole 75 to 1.5 in., slightly winged, and somewhat dilated at the base, puberulous. Panicles numerous, axillary and terminal, branched from the base, about 12 in. long, the branches with slender

cinereous-tomentose branchlets and numerous softly pubescent flowers; bracts large, obovate, concave, membranous. Flowers '25 in. long, on pedicels shorter than the buds. Calyx narrowly ovoid, very membranous. Petals narrowly oblong, villous on both surfaces, inserted towards the base of the short disc. Stamens 5. Ovary shortly stalked, densely pilose, attenuated into a style longer than itself. Drupe unknown. Engler in DC. Mon. Phan. IV, 235. Stigmaria verniciflua, Jack? in Wall. Cat. 980.

I have seen only Wallich's specimen of this in the Calcutta set of his plants. The specimen is a very poor one, and the above description is taken mostly from Sir Joseph Hooker. Mr. Derry collected in Malacca, (Herb. No. 1010) a plant of which there are two fruiting specimens in the Calcutta Herbarium which, from the shape of its leaves, I would have referred to this, were it not that remains of numerous stamens persist at the base of one of the young fruits. Mr. Derry's plant must I believe belong to an as yet undescribed species.

3. MELANORRHEA WOODSIANA, Scort. MSS. in Herb. Calc. A tree 60 to 100 feet high; young branches velvetty, ferrugineous. Leaves thickly coriaceous, elliptic-oblong, elliptic or elliptic-rotund, the apex obtuse or rounded or emarginate, the edges sub-undulate, the base rounded or subcuneate; upper surface glabrous, the transverse reticulations rather distinct; the lower surface densely and uniformly rusty-tomentose, or glabrescent with age: main nerves 15 to 24 pairs, sub-horizontal, very prominent on the lower surface slightly so on the upper; length 4 to 5.5 in., breadth 1.75 to 3.5 in.; petiole 1 to 1.35 in., deeply channelled, dilated at the base, tomentose or glabrescent. Panicles from the upper leaf-axils, longer than the leaves, on long peduncles densely and minutely rusty-tomentose, branching more or less trichotomously towards the apex; the ultimate branches compressed, cymulose. Flowers subsessile, 25 in. long, enveloped while in bud by imbricated concave broadly-ovate tomentose bracts; buds narrowly elliptic; the spathaceous calyx membranous, veined, puberulous. Petals 5, oblong. Stamens 5, anthers versatile, filaments hairy. Ovary obliquely ovoid, style lateral. Drupe elliptic, smooth, without a pedicel; the enlarged petals narrowly elliptic, obtuse, puberulous, red in colour, 1.5 in. long and 75 in. broad (perhaps not quite fully grown).

Perak: Scortechini, No. 2086; King's Collector, No. 7788.

This has as yet been collected only by the late Father Scortechini and Mr. Kunstler, and their specimens have no ripe fruit. It approaches M. Maingayi in its leaves, but has much more tomentose panicles. The great distinctive mark, however, is that the flower buds of this are each enveloped in a large concave sheathing bract. As regards the pubes-

cence of the under surface of the leaves in this species there is some diversity, many specimens having the under surface covered with a dense and uniform layer of rusty tomentum, while in other specimens the lower surface of the leaves and the petioles are glabrescent. The species was named by Father Scortechini to commemorate his friend, the Revd. Father Tennison Woods, who died of an illness contracted during his exploration of the physiography of the central mountainous range of the Malayan Peninsula.

4. MELANORRHEA CURTISH, Oliver in Hook. Ic. Plantar, t. 1513. A tree 40 to 80 feet high: young branches very slender. Leaves coriaceous, oblong-lanceolate or elliptic-oblong, obtuse, or shortly and bluntly acuminate, the base cuneate, both surfaces quite glabrous and without scales or dots; main nerves 12 to 16 pairs, spreading, curving, faint; length 3 to 5 in., breadth 1.25 to 2 in.; petiole .5 to .75 in. Panicles slender, open, axillary and terminal, pedanculate, much longer than the leaves; the branches opposite or sub-opposite, distant, lax, each bearing several ultimate few-flowcred branchlets near the apex, puberulous close to the flowers, otherwise quite glabrous; bracteoles small, ovate-lanceolate, caducous. Flowers 25 in. long, on puberulous pedicels, the buds narrow. Calyx with dark nerves. Petals 5, linear, puberulous outside, contorted in estivation. Stamens 10, a little shorter than the petals, glabrous; the filaments slender; the anthers small, oval. Disc pubescent. Ovary obliquely ovoid, stalked, glabrous. Style sub-terminal. Drupe depressed-globose, '5 to '75 in. in diam., its stalk :35 in.; the enlarged petals leathery, linear-oblanceolate, 1.75 to 2.5 in. long. M. Duthieana, Scort. MSS. in Herb. Calcutta.

Penang: Curtis, No. 242; King's Collector, No. 1635. Perak: King's Collector, No. 6887. Kedah: Ridley, No. 5359.

The late Father Scortechini notes on this that the stamens are occasionally 8 instead of 10.

5. Melanorrhea torquata, King n. sp. A tree 80 to 100 feet high: young branches stout, and with rough rather pale brown bark. Leaves coriaceous, obovate, with broad rounded apices, sub-undulate edges, and sharply cuneate bases; both surfaces glabrous, the upper with the reticulations almost obsolete, the midrib very broad and flat; the lower with the transverse veins rather distinct, the midrib sharply convex; main nerves 22 to 26 pairs, rather faint on the upper surface when dry, very distinct on the lower, spreading and rather straight; length 7 to 11 in., breadth 4 to 6.25 in.; petiole 25 to 35, stout. Panicles terminal, branching from the very base, densely and minutely tawnytomentose; the branches spreading, naked below but with many branchlets toward the apex, the ultimate branchlets cymulose. Flowers 25 in.

long, on pedicels 2 in. long, buds ellipsoid. Calyx tubular or narrowly campanulate, its mouth with 3 broadly-triangular unequal teeth, puberulous externally, withering and hanging round the pedicels like a loose collar. Peials 5, slightly imbricate, elliptic, sub-acute, spreading or sub-reflexed, 2 in long, tomentose outside, pubescent inside. Stamens 5, nearly as long as the petals; anthers small, ovate; filaments subulate, pubescent below the middle. Ovary globose or obovoid, shorter than the gynophore, both tomentose; ovule solitary, its podosperm from the very base of the cell: style longer than the ovary, cylindric, pubescent except near the apex. stigma truncate. Fruit unknown.

Perak: King's Collector, No. 5552.

This differs in calyx from Melanorrhæa as usually understood, inasmuch as in this plant the calyx separates from the flower soon after expansion and remains as a loose 3-toothed collar hanging round the pedicel; whereas in Melanorrhæa, as hitherto defined, the calyx is calyptriform and is pushed off the flower by the expansion of the petals. In both cases the calyx is deciduous; in the one case it separates from the flower by the apex of the latter, in the other case by its base.

6. MELANORRHOEA APTERA, King.n. sp. A tree 40 to 70 feet high; young branches stout, with rough cinereous bark, the cicatrices of the fallen leaves very prominent. Leaves very coriaceous, oblanceolateoblong or obovate-elliptic; the apex broad and rounded, rarely with a short sub-acute point; narrowed from above the middle and decurrent on the short stout petiole; the edges quite entire, slightly revolute when dry; both surfaces glabrous; the upper pale greenish-brown when dry, the lower brown, the midrib on the upper surface broad and flattened in its lower half, on the lower surface convex; main lateral nerves 15 to 18 pairs, spreading, rather straight, somewhat prominent beneath; length 6 to 15 in., breadth 2 to 6 in.; petiole 5 to 1 in., stout. Panicles shorter or longer than the leaves, axillary, crowded near the ends of the twigs; their branches short, racemose, few-flowered, glaucous. Flowerbuds narrowly ellipsoid, glabrous, ebracteate. Flowers 1 in. in diam., their pedicels '25 to '3 in. long, sparsely adpressed-pubescent. Calyx glabrous, about 5 in. long at the time of falling. Petals 5 or 6, much imbricate, oblanceolate, densely adpressed-sericeous outside, glabrous inside. Stamens numerous (about 50), on a conical torus which is produced upwards into a gynophore. Ovary obliquely ovoid, compressed, ridged, glabrous, 1-celled, with a single oblong ovule pendulous from a basal funicle. Style sub-terminal, stout, bent, glabrous, longer than the ovary; stigma short, cylindric. Drupe depressed-globose, glabrous, with numerous thin vertical ridges, 1.5 in. in diam. Seed solitary,

1 in. long, the testa thin: cotyledons plano-convex, very thick and fleshy.

Perak: King's Collectors, No. 3485, 3727, 7656. Penang: Curtis, No. 1567.

A fine species readily distinguished by its large flowers and inappendiculate fruit.

7. Melanorrhoea inappendiculata, King n. sp. A tree 50 to 60 feet high; young branches only as thick as a swan's quill, cinereous, rough. Leaves coriaceous, oblong-oblanceolate; the apex broad and rounded, sometimes retuse; the blade narrowed from above the middle to the narrowly cuneate base and prolonged along part of the petiole, the edges slightly revolute; both surfaces glabrous; main nerves 15 to 18 pairs, spreading, straight, slender; length 3.5 to 5 in., breadth 1.5 to 2 in.; petiole 75 to 1 in., winged for half its length. Panicles about as long as the leaves, axillary, solitary in the axils of the leaves, few-flowered. Flowers 75 in. in diam.; petals narrowly elliptic, blunt; ovule oblong, pendulous, its funicle attached to the side of the base of the wide loculus of the ovary, otherwise as in M. aptera. Drupe globular, glabrous, 1 to 1.5 in. in diam.

Perak: King's Collector, No. 5418. Penang: Curtis, No. 2475.

This is a second species of Melanorrhanoea with non-accrescent petals. According to Mr. Curtis the petals are white, with a pink flush at the base, and the filaments are pink, while the anthers are green. The attachment of the funicle of the ovule in this species is to the side of the base of the ovular loculus, whereas in M. aptera it is attached to the centre of the base.

7. SWINTONIA, Griff.

Trees, quite glabrous. Leaves alternate, long-petioled, simple, quite entire. Panicles terminal and axillary, very large and broad. Flowers small, hermaphrodite or unisexual. Calyx small, 5-lobed; lobes rounded, imbricate. Petals 5, adnate to the middle of the disc, linear-oblong, imbricate, much enlarged and reflexed in fruit. Disc short or elongate or cylindric. Stamens 5, inserted on the top of the disc, free. Ovary sessile, ovoid, 1-celled, narrowed into the slender style; stigma capitellate; ovule pendulous from a basal funicle. Drupe ovoid, smooth, sessile, coriaceous, subtended by the 5 reflexed enlarged petals. Seed erect, testa thin, cotyledons amygdaloid. DISTRIB. The following are the only species known.

Bracts of the panicle inconspicuous or absent.

Leaves sub-coriaceous, main nerves 14 to 18

pairs; flowers on very short pedicels ... 1. S. Schwenkii.

Leaves coriaceous, main nerves 10 to 12 pairs, inconspicuous; pedicels longer than the flower, slender 2. S. Penangiana. Flower-buds embraced by large concave imbricate bracts 3. S. spicifera.

Imperfectly known species ... 4. S. lurida. ... 1. SWINTONIA SCHWENKII, Teysm. and Binn. Cat. Hort. Bogor. (1866) p. 230. A tree; young branches slender, glaucous. Leaves sub-coriaceous, oblong-lanceolate or narrowly elliptic, shortly and obtusely acuminate, the edges sub-undulate, the base slightly narrowed but usually rounded; both surfaces obscurely reticulate, the lower paler when dry; main nerves 14 to 18 pairs, spreading and rather straight: length 3 to 6 in., breadth 1.25 to 1.5 in.; petiole 1.25 to 1.5 in. slender. with a slight swelling at the very base. Panicles crowded at the ends of the branches in the axils of the upper leaves, slender, usually longer than the leaves, pedunculate; the branches short, alternate, spreading, the ultimate branchlets cymose. Flowers polygamous, '1 in. diam., on very short pedicels. Segments of the calvx united only at the base. orbicular, concave, glabrous. Petals oblong, obtuse, pubescent on both surfaces, rapidly enlarging in the ripe fruit and reflexed, 2.5 in. long, narrowly oblong, coriaceous, veined. Drupe oblong, smooth, .75 in. long. Kurz in Journ. As. Soc. Beng. Vol. XXXIX, Pt. 2, (1870), 75; Engler in DC. Mon. Phan. IV, 232. Anauxanopetalum Schwenkii, Teysm. and Binnend, in Miquel Journ. I, 368. Astropetalum 2, Griffith, Notul. IV, 415.

Malacca: Griffith, No. 1156; Maingay, No. No. 486.—DISTRIB Sumatra.

I have followed Sir Joseph Hooker and Dr. Engler in identifying this Malacca species of Swintonia with S. Schwenkii, T. B., although the specimens in the Calcutta Herbarium hardly bear this out. In the Calcutta Herbarium there are authentic specimens of Anauxanopetalum Schwenkii—the name originally given to the species by Teysm. and Binn. These specimens were collected in the Beuitenzorg garden and were sent out by its authors. They are therefore practically type specimens, for as the authors explain (Miq. Journ. Bot. I, 369) the species was named in the Beuitenzorg garden from specimens taken from trees originally received from Sumatra by Major Schwenk. Dr. Anderson in 1861 also collected in the Beuitenzorg garden specimens of the same. These Beuitenzorg specimens all agree in having flowers with rather long pedicels. Now, in describing S. Schwenkii in the Fl. Br. India from the Malacca specimens, Sir Joseph Hooker makes it a diagnostic mark of the species, as understood by him, that the flowers

are subsessile. In their leaves the Malacca and Beuitenzorg specimens closely resemble each other, but the panicles of the latter are much larger than those of the former. I think it possible therefore that, when better specimens of the Malacca plant are collected, other characters may be found, which will prove that it is not really the same as S. Schwenkii, T. and B.

2. SWINTONIA PENANGIANA, King n. sp. A tall tree: young branches slender, glaucous. Leaves coriaceous, oblong-lanceolate, rarely ovate-lanceolate, tapering from the middle to the shortly bluntly acuminate apex and to the cuneate base; main nerves 10 to 12 pairs, spreading, faint on both surfaces, the reticulations obsolete: length 3 to 4.5 in., breadth 1.1 to 1.4 in.; petiole .75 to 1.25 in., slender, but slightly thickened near the base. Panicles axillary and terminal, as long as or longer than the leaves, pedunculate, slender, glabrous: the branches lax, spreading, the flowers in ultimate cymules of about three. Flowers ·15 in. long; their pedicels slender, longer than themselves. Calyx narrowly campanulate, with 5 broad subtruncate sub-ciliate lobes. Petals 5, longer than the calyx, sub-erect, oblong, obtuse, minutely tomentose with glabrous margins. Stamens 5; the anthers elliptic, dorsifixed, the filaments slender. Disc thin, cylindric. Ovary obliquely ovoid, pubescent, tapering into the short sub-terminal style, stigma rather large for the genus, Drupe globular, glabrous, smooth, 5 in. in diam., the reflexed accrescent petals narrowly oblong, sub-acute, about 1:35 in. long and '3 iu, wide, glabrescent.

Penang: Curtis, No. 1579.

A species allied to *S. floribunda*, Griff., but with shorter panicles, and globular not oblong, fruit. The leaves of this moreover are more coriaceous and have fewer nerves than these of *S. floribunda*.

3. Swintonia spicifera, Hook. fil. Fl. Br. Ind. II, 27. A lofty tree: young branches smooth, reddish when fresh. Leaves coriaceous, oblanceolate or elliptic-obovate, the apex sub-acute or obtuse, the base attenuate-cuneate; upper surface shining, not reticulate, the lower pale brown when dry and glaucous: main nerves 13 to 20 pairs, obsolete on the upper and only slightly promineut ou the lower surface, spreading, slightly curved; length 3.25 to 4.5 in., breadth 1.5 to 1.75 in.; petiole 6 to 1.25 in. Panicles crowded near the ends of the branches, long-pedunculate, exceeding the leaves; the branchlets articulate, corymbosely crowded and trichotomously branched, angled, puberulous. Flowers 2 in. long, each on a pubescent pedicel embraced by a broadly-ovate concave puberulous bracteole. Calyx fleshy, tubular, with 5 deep quadrate segments, puberulous outside, glabrous inside. Petals 5, twice as long as the calyx, thick, obovate-oblong, obtuse, concave, shortly

clawed. Stamens 4 or 5, shorter than the petals, filaments slender, the anthers short oblong; disc thin, cylindric. Ovary stalked, obliquely ovoid, puberulous. Drupe obliquely ovoid, smooth, '75 in. long, the accrescent petals reflexed, coriaceous, veined, 1.75 in. long, pericarp thin. Engler in DC. Mon. Phan. V, 233.

Penang: Maingay, No. 486/2; Curtis, No. 371; King's Collector, No. 1802. Perak: Scortechini, Nos. 1891, 2083; King's Collector, Nos. 3534, 3677.

Var. Scortechinii, King; leaves oblong-lanceolate, shortly and bluntly acuminate, the base rounded or sub-cuneate, main nerves 12 to 14 pairs.

Perak: Scortechini, No. 1891.

This species and its variety are both notable for the bracts which embrace the flower-buds.

4. SWINTONIA LURIDA, King n. sp. A small tree: all parts quite glabrous; the young branches slender, striate and dark-coloured when dry: Leaves thinly coriaceous, narrowly elliptic-oblong, the edges slightly thickened and undulate, the apex shortly abruptly and bluntly acuminate, the base cuneate, decurrent on the petiole; both surfaces glabrous and minutely reticulate; the upper shining, olivaceous green when dry; the lower dull, pale liver-coloured when dry; main nerves 22 to 24 pairs, rather faint, spreading to the edge without interarching, the secondary nerves almost as prominent: length 6 to 8 in., breadth 1.5 to 2.25 in.; petiole 6 to 75 in., thickened near the base. Panicle terminal, branching from the base, drooping, slender; the branches long, bearing short branchlets with the numerous flowers in small cymes. MALE FLOWERS a little more than '1 in. long, pedicelled. Calyx cupular, fleshy, with 5 broadly triangular teeth, glabrous. Petals 5, twice as long as the calyx, pale, oblong-elliptic, obtuse, with a truncate base, glabrous. Stamens inserted outside the shallow cupular dark-coloured slightly 5-lobed fleshy disc, shorter than the petals: anthers short, ovate, dorsifixed; filaments broadly subulate, with a very fine-pointed apex. Rudimentary ovary narrowly elliptic, sunk in the disc, tapering slightly upwards; no distinct style, stigma small, concave. Semecarpus? lurida, Hook. fil. Fl. Br. Ind. II, 34; Engler in DC. Mon. Phan. IV, 496.

Malacca: Maingay, No. 495. Perak: Wray, No. 3249.

A species of which female flowers and fruit are still unknown. Maingay's specimens were originally described by Sir Joseph Hooker as a doubtful species of Semecarpus, under the name? S. lurida. They are very incomplete. Since Maingay's time good specimens of exactly the same plant, but still without female flowers or fruit, have been

collected by Mr. L. Wray in Perak. These have enabled Dr. Stapf, of the Kew Herbarium, and myself to refer the plant to the genus Swintonia, its nearest allies being S. floribunda and S. Schwenkii. In Wray's field note on his specimens he writes "flower pale-greenishyellow: leaves shining, bright green above; pale and bluish beneath."

8. Parishia, Hook. fil.

Tall trees with alternate unequally-pinnate leaves; the leaflets coriaceous, entire. Panicles large, nodding. Flowers diceious. Male Flower. Calyx cupular, 4-lobed; the lobes ovate, valvate. Petals 4, oblong, imbricate. Disc short, annular, obscurely 4-lobed. Stamens 4, inserted below the margin of the disc. Rudimentary ovary cylindric. Female Flower. Calyx 4-lobed, the lobes persistent and greatly enlarged in fruit. Petals 4. Ovary sessile, ovoid, 1-celled; style terminal, unequally 3-fid, stigmas capitate; ovule pendulous from near the apex of the cell. Fruit sub-globose, dry, pubescent, bearing the persistent base of the style at its apex, the pericarp thin. Seed pendulous, its testa membranous; cotyledons amygdaloid, radicle superior.—Distrib. 5 species, all either Burmese or Malayan.

Wings of accrescent-calyx 2.5 to 3 in. long ... 1. P. insignis. Wings of accrescent-calyx 4.5 in. and upwards in

length.

Leaflets glabrous beneath, the midrib and nerves very slightly puberulous... ... 2. P. Maingayi. Leaflets rusty-pubescent on the lower surface 3. P. pubescens.

1. PARISHIA INSIGNIS, Hook. fil. in Trans. Linn. Soc. XXIII, 170, t. 26. A tall tree; young branches stout, lenticellate, rusty-puberulous. Leaves 12 to 20 in. long, the rachis cylindric: leaflets 6 to 8 pairs, thinly coriaceous, obliquely ovate-oblong to oblong-lanceolate, acute or shortly acuminate; the base broad, rounded or sub-cordate, unequal; upper surface shining, glabrous or glabrescent, the lower glabrescent and reticulate, or (var. pubescens) shortly and softly pubescent; main nerves 8 to 12 pairs, spreading, curving: length 3 to 5 in., breadth 1.2 to 2 in.; petiolule '1 to '2 in. MALE PANICLES as long as the leaves, much branched, many-flowered, rusty-pubescent or tomentose. Flowers 25 in. in diam., on pedicels longer than themselves. Calyx rustvpubescent; its lobes unequal, triangular. Petals oblique, broadly ovate, sub-glabrous, reflexed at the apex, longer than the calyx. Stamens about as long as the petals; the anthers short, ovate, about one-third as long as the filaments. Disc pubescent, 4-angled. Female flower not seen. Fruit sub-globular, 5 in. in diam., the persistent remains of the style ·15 in. long; accrescent calyx-wings narrowly oblong, blunt, 2.5 to 3

in. long, veined, pubescent. Hook. fil. Fl. Br. Ind. II, 30; Kurz For. Flora Bnrma, I, 318; Engler in DC. Mon. Phan. IV, 309. Astronium insigne, March. Rev. Anacard., 179.

Andaman Islands. Penang: Curtis, No. 2264. Laugkani: Curtis, No. 2806.—DISTRIB. Burma.

This species has not hitherto been supposed to go farther south than Burma. But it appears to me that Mr. Curtis's No. 2806 from Langkani (an island off the coast a little to the southward of Burma) is probably this species, and also that his No. 2264 from Penang likewise belongs to this.

Var. tomentosa, King: leaflets pubescent on the lower surface. Panicles and calyx in all its stages densely rusty-tomentose.

Andaman Islands: King's Collectors.

2. Parishia Maingayi, Hook. fil. Fl. Br. Ind. II, 30. A tree: young branches stout, glabrous, sparsely lenticellate. Leaves 12 to 15 in. long, the petioles slightly dilated at the base; leaflets very coriaceous, 9 to 10 pairs, narrowly oblong or elliptic-oblong, not oblique, the apex acute, the edges sub-undulate, the base rounded or slightly cuneate; both surfaces shining and indistinctly reticulate, the upper quite glabrous, the lower slightly puberulous on the midrib and nerves; main nerves 15 to 20 pairs, spreading, faint: length 2.5 to 3.5 in, breadth 1 to 1.25 in.; petiolules about 2 in. Panicles (fide Sir J. Hooker) apparently shorter than the leaves, pubescent. Petals linear-oblong. Disc pilose, young fruit narrowly ovoid, tapering to a long point, densely rusty-tomentose; the enlarged calyx-wings linear-oblong, sub-acute, pale, puberulous, sub-coriaceous, striate, 4.5 in. long and about 5 in. broad.

Malacca: Maingay, No. 488.

Except Maingay's, I have seen no specimens which I can refer to this species. I have copied from the Fl. Br. Ind. Sir J. D. Hooker's description of the panicles and flowers, neither of these being represented in the Calcutta Herbarium. There is some doubt as to whether the fruits and leaf specimens brought together by Maingay really belong to the same tree; and not only so, but it is doubtful whether the fruits of two species have not been mixed up by him. For Sir Joseph Hooker notes that, while some of the fruits are densely covered with hispid ferrugineous bristles and have accrescent calyx-wings 6 to 7 inches long with rounded apices, others are pubescent and have wings only 4.5 in. long with acute tips. The species clearly requires investition in the field.

3. Parishia pubescens, Hook. fil. Fl. Br. Ind. II, 30. A lofty tree: young branches stout, deciduously rusty-tomentose. Leaves 12 to 18 in long; the petiole pubescent, terete above, dilated near the

base; leaflets 5 to 7 pairs, subsessile, thickly coriaceous, oblong, acute or acuminate, the base rounded, upper surface glabrous except the densely pubescent midrib; the lower shortly rusty-pubescent, retienlate; main nerves 12 to 16 pairs, irregular, spreading and ascending, curved, prominent on the lower surface when dry; length 4.5 to 5.5 in., breadth about 1.5 in.; petiolules very short (only .05 to .1 in.) or absent. Panicle rather shorter than the leaves, divided to the base into numerous fascicled branches, densely and softly tomentose. Flowers .5 in. in diam., pedicelled. Ovary conical, pilose; styles 3? Fruit broadly ovoid, apiculate, .5 in. long, densely tomentose, the pericarp cartilaginous; accrescent-calyx-wings thinly coriaceous, pale, striate, adpressed-puberulous* or almost glabrous, narrowly oblong, sub-acute, 4.5 to 5 in. long and about .5 in. broad. Engler in DC. Mon. Phan. IV, 3 10.

Malacca: Maingay, No. 487.

A very imperfectly known species collected hitherto only by Maingay, and as much in want of investigation as the last.

9. CAMPNOSPERMA, Thwaites.

Trees. Leaves alternate, very coriaceous, simple, quite entire. Racemes axillary, simple or sparingly branched. Flowers sessile, minute, hermaphrodite. Calya 3-5-partite; segments erect, persistent, imbricate. Petals 3-6, suborbicular, erect, imbricate. Disc urceolar. Stamens 6-10, inserted at the base of the disc. Ovary free, sessile, ovoid, 1-celled; style very short, stigma discoid or capitate; ovule 1, pendulous from the top of the cell. Drupe ovoid, fleshy; stone hard, almost 2-celled by a vertical plate from the top of the horse-shoe-shaped cell. Seed pendulous, curved round the imperfect septum: cotyledons curved, rather flat; radicle short superior.—DISTRIB.

Male flowers sessile 1. C. Griffithii.

Male flowers pedicelled.

Female flowers in short racemes; the males in long panieles; fruit '6 in. in diam. ... 2. C. auriculata. Male and female flowers in sub-equal panieles; fruit '2 to '25 in long ... 3. C. Wallichii.

1. Campnosperma Griffithii, Marchand Rev. Anacard. 174. A tree 60 to 80 feet high; young branches very stout, rough and with sparse minute tomentum. Leaves very coriaceous, obovate-oblong or elliptic, the apex very broad rounded or emarginate, the edges slightly recurved when dry, the base much cuneate, slightly decurrent on the broad stout channelled petiole: upper surface quite glabrous, the midrib depressed; lower surface minutely stellate-pubescent, the midrib very

convex and strong; main nerves 24 to 36 pairs, spreading, only slightly curved, projecting on the lower surface, depressed on the upper; length 7 to 15 in., breadth 3.5 to 5.5 in.; petiole 1.25 to 2.5 in., tomentose, dilated at the base. Panicles of male flowers axillary, slender, shorter than the leaves, rusty stellate-tomentose; the branches only a few inches long, spreading, spicate, bearing the flowers in small crowded sessile glomeruli. Flowers about .05 in. diam., sessile. Calyx thick, cupular, cut into 4 broad sub-acute concave ovate-rotund segments, rusty-tomentose outside. Petals 4, a little exceeding the calyx, thin, pale, glabrous, elliptic-ovate, concave. Stamens 4 or 8 in two rows; filaments thickly subulate, anthers short; disc crenate, fleshy. Panicle of female flowers shorter and less branched than that of the males. Drupe ovoid, slightly oblique, glabrous, .35 in. long. C. macrophylla, Hook. fil Fl. Br. Ind. II, 41; Engler in DC. Mon. Phan. IV, 316; Mig. Fl. Ind. Bat. I, pt. 2, p. 637.

Malacca: Griffith, No. 1109; Maingay, No. 484/2. Singapore: T. Anderson, No. 71. Perak: Wray, No. 2575; King's Collector, No. 5327, 6528, 6541 and 7292.—DISTRIB. Sumatra, Borneo, Bangka.

This species was first named as a Campnosperma by Marchand in 1869, and he based his description of it on Griffith's Malacca specimen No. 1109. The plant had previously (1850) been named Buchanania macrophylla by Blume in Mus. Bot. Lugd. Bat. I, 185. Had Marchand known this, he ought to have named it Campnosperma macrophylla instead of C. Griffithii. It is easily recognised by its sessile glomerulate flowers; although its fruit closely resembles that of the plant which is accepted as C. Griffithii both by Sir Joseph Hooker and by Dr. Engler, but which is here named C. Wallichii.

2. Campnosperma auriculata, Hook, fil. in Fl. Br. Ind. II, 41. A tall shrubby tree: young branches as thick as a swan's quill, glabrous, polished, lenticellate. Leaves thinly coriaceous, obovate-oblong or oblanceolate-oblong, the apex rounded sometimes retuse or emarginate, tapered gradually in the lower two-thirds and continued down the petiole as a wing to its slightly auricled base; both surfaces glabrous, minutely reticulate; main nerves 9 to 18 pairs, oblique, not prominent on either surface; length 4 to 9 in., breadth 1.75 to 3 in.; petiole below the auricles only 1 or 2 in., glabrous. Panicles of male flowers 10 to 14 in. long, axillary, covered with scurfy minute stellate rusty tomentum; the branches slender and with numerous many-flowered branchlets. Flowers pedicellate, 15 in. in diam. when expanded. Calyx cupular, puberulous outside, with 4 broadly triangular segments. Petals 4, twice as long as the calyx-teeth, elliptic, obtuse, deflexed. Stamens 8; four longer than the others, spreading and longer than the petals, the other 4 shorter. Disc

large, fleshy, corrugated, ovary none. Female Flowers in racemes shorter than the panicles of the males and stouter. Flowers 15 in. in diam., on stout puberulous pedicels. Calyx thick, cupular, puberulous, with 4 broad triangular segments. Petals 4, broadly triangular, puberulous, larger than the calyx-segments. Stamens 8, shorter than the petals, the anthers imperfect. The disc a deep fleshy cup with crenate edges. Ovary broadly ovoid, rusty-tomentose, crowned by the large discoid glabrous obscurely-lobed reflexed stigma. Drupe ovoid-rotund, compressed, minutely tomentose, fleshy, 6 in. in diam. Engler in DC. Mon. Phan. IV, 320. Buchanania auriculata, Blume in Mus. Bot. Lugd. Bat. I, 185. Semecarpus? grandifolia, Wall. Cat., No. 985 (exclude the specimens mentioned in the Appendix to the Cat.).

Penang: Wallieb, No. 985. Malacca: Maingay, No. 484/4. Singapore; Kurz, Anderson, No. 69; Ridley, Nos. 444, 1880 and 4775 E.; Hullett, No. 223. Penang: Curtis, No. 1037.

This is distinguished from the next species by its smaller leaves and panicles and much larger fruit. It is the plant from Penang, issued by Wallich as No. 985 of his Catalogue, which he doubtfully referred to the genus Semecarpus, as S.? grandifolia. Along with this however Wallich issued, as noted in the Appendix to his lithographed Catalogue, p. 286) under the same number, and not (as is usual with Wallich's plants in similar cases) distinguished by any letters, the much larger (although in other respects similar) leaves of another species. The specific name grandifolia is not applicable to the present plant which is the true Buchanania auriculata of Blume (not however of Miquel), although it is applicable to the supplementary sheets of 985, one of which, as issued by Wallich is 30 inches in length. I have followed Sir Joseph Hooker and Dr. Engler in retaining Blume's specific name auriculata for the present plant. But, for the supplementary sheets, I do not propose to retain Wallich's name of grandifolia (his name having really been given to two things), but I propose for them the name Campnosperma Wallichii. In this I do not follow the distinguished Botanists just mentioned, for they call them C. Griffithii, Marchand. But Marchand's name, in my opinion, ought to be given to the plant on which he founded that species, which (as he mentions in his Monograph) was Griffith's No. 1109. And this I do in spite of the fact that Griffith's No. 1109 is exactly what Blume named Buchanania macrophylla. There is no doubt that, had Marchand known of Blume's name, he ought to have called his plant Campnosperma macrophylla. But as he did not, and as he was the first to put the plant into the genus Campnosperma, his name C. Griffithii must I think remain; and another name must be found for what Sir Joseph Hooker and Dr. Engler name C. Griffithii:

and that other name I propose to make C. Wallichii, in commemoration of its earliest collector.

3. Campnosperma Wallichii, King. A tall much-branched tree: young branches very stout, rough. Leaves coriaceous, the blade obovateoblong with broad rounded and sometimes emarginate apex, tapering from about the middle downwards, forming a narrow wing to the petiole and expanding at its base into a small auricle; both surfaces glabrous and minutely reticulate; main nerves 20 to 30 pairs; length 10 to 30 in., breadth 4 to 7 in.; petiole 2 to 3 in. long, dilated, channelled, glabrous. Panicles of Male Flowers axillary, shorter than the leaves, stellately rusty-tomentose, with slender much-branched suberect many-flowered branchlets. Male flowers 1 in. in diam., pedicelled; calyx thick, puberulous outside, its segments 4, broadly triangular, blunt; petals 4, larger than the calyx segments, ovate-rotund, concave, glabrous; disc fleshy, corrugated: stamens 8 in two rows, the outer 4 slightly longer than the inner 4. PANICLES OF FEMALE FLOWERS about the same length as those of the male, but with shorter branches and fewer flowers; flowers larger than the males; ovary ovoid, puberulous; drupe ovoid-globular, slightly compressed, glabrous, '2 to '25 in. long. C. Griffithii, Hook. fil. in Fl Br. Ind. II, 41 (not of Marchand); Engler DC. Mon. Phan. IV. Campnosperma auriculata, Mig. (not of Blume) Fl. Ind. Bat. I, pt. 2, p. 637. Semecarpus? grandifolia, Wall. Cat. 985 in part (i.e. as to the specimens mentioned on p. 286 of the Appendix to the Catalogue.)

Penang: Porter, (Wall. Cat., 985). Malacca: Maingay, No. 464/3. Singapore: Kurz, Goodenough.—Distrib. Sumatra: Forbes, No. 3030.

This is in general appearance very like C. auriculata. The great difference between the two lies in the fruit which in this is only about 2 in. long, while in M. auriculata it is 6 in in diam. Other distinctions are to be found in the leaves, which in this are larger than in C. auriculata. The texture and venation are, however, the same in both; and both have curious small rounded auricles at the base of the petiole. The panicles of male and female flowers in this species are sub-equal, whereas in M. auriculata the panicles bearing male flowers are several times longer than these bearing females.

10. MICROSTEMON, Engler.

Trees, with alternate exstipulate unequally-pinnate leaves. Flowers small, in axillary many-branched panicles, hermaphrodite. Calyx small, with 5 imbricate segments. Petals 5, much larger than the calyx, obovate, spreading, imbricate in estivation. Disc annular, subcreet, 10-toothed. Stamens 5, alternating with an equal number of capitellate

or spathiform staminodes: filaments very short, thickened towards the base; anthers broadly ovate, dorsifixed. Ovary ovoid-globose, its base immersed in the disc, unilocular, with a single pendulous ovule. Style terminal, very short, thick; the stigma broad, fleshy, with 3 broad spreading, blunt lobes. Fruit obliquely oblong-ovoid, attenuate towards the apex; the pericarp leathery, 1-celled, 1-seeded. Seed with membranous testa, exalbuminous, the cotyledons flat, the radicle curved.—Distrib. three species, all Malayan.

Leaflets tomentose on the lower surface ... 1. M. velutina.

Leaflets glabrescent and minutely scurfy (when dry) on the lower surface, the axils of the main nerves with tufts of white hair ... 2. M. Curtisii.

1. MICROSTEMON VELUTINA, Engler in DC. Mon. Phan. IV, 294. A tall tree: young branches, rachises and under surfaces and petioles and rachises of leaves and the inflorescence softly pubescent tomentose, rusty-cinercous. Leaves 6 to 10 in. long, the petiole slender; leaflets 7 to 11, thinly membranous, oblong-lanceolate, entire, shortly and bluntly acuminate; the base slightly narrowed, cuneate or rounded: upper surface glabrous except the pubescent midrib; main nerves 12 to 16 pairs, spreading, rather obscure; length 2 to 4 in, breadth 8 to 15 in; petiolule 15 in., the terminal one longer. Panicles pedunculate, much branched towards the apex, the branches very slender. Flowers numerous, less than 1 in. in diam., sessile. Calyx glabrous, the lobes elliptic. Petals obovate, glabroscent on the outer surface minutely tomentose on the inner. Fruit narrowly oblong, compressed, with a rusty scurfy leathery pericarp, 1-celled, 1-seeded (young) 75 in. long and 35 or 4 in. broad. Pentaspadon? velutinus, Hook. fil. Fl. Br. Ind. II, 28.

Malacca: Griffith, Maingay (Kew Distrib.), No. 464. Perak: Scortechini, No. 1924; King's Collector, No. 7417. Pahang: Ridley, No. 2560.

2. MICROSTEMON CURTISII, King. A medium sized tree (Curtis); young branches slender, deciduously puberulous, their bark pale and lenticellate when dry. Leaves 5 to 7 in. long, the petiole and rachis slender and puberulous; leaflets very dark when dry, about 7, membranous, narrowly oblong-lanceolate, acuminate, entire, the base rounded and slightly oblique, with scattered short hairs, the midrib and nerves pubescent, not reticulate; lower surface glabrescent, minutely scurfy when dry, the midrib and nerves puberulous; main nerves 13 to 17 pairs, ascending, curved, with conspicuous tufts of white hair at their junction with the midrib: length 1.75 to 3 in., breadth .75 to .9 in.; petiolules .1 in., the terminal one .2 in. Panicles near the end of the branches, axillary, slender, slightly longer than the leaves,

pedunculate, puberulous; the branches divergent, the flowers solitary or in clusters of 2 to 4 at rather distant intervals. Flowers less than 1 in. in diam., on pedicels shorter than themselves. Calyx cupular, with 5 spreading concave broadly ovate acute segments, puberulous outside, glabrous inside. Petals 5, broadly elliptic, very obtuse, twice as long as the calyx, minutely pubescent on the inner surface, glabrescent on the outer. Stamens 5, shorter than the petals, the filaments not swollen at the base. Disc glabrous. Ovary conical, glabrous: stigma minute. Drupe unknown.

Kedah: Curtis, No. 2620.

A species of which I have seen only Mr. Curtis's specimen from Kedah. It is readily distinguished from the preceding two by the tufts of white hair in the axils of the main nerves on the under surface of the leaflets. The stigma is very minute and it is not easy to make out the three lobes which characterise the genus. The flowers have, however, the staminodes and disc of the genus.

11. Pentaspadon, Hook. f.

Trees. Leaves unequally pinnate; leaflets opposite, sub-sessile, entire. Panicles axillary, peduncled, much-branched, branchlets very slender. Flowers pedicelled, minute, hermaphrodite. Calyx-lobes 5, imbricate. Petals 5, oblong-obovate, strongly imbricate. Stamens 5, minute, inserted at the base of the disc, alternate with 5 short subulate staminodes which are free or adnate to the side of the disc; filaments short, broadly subulate; anthers didymous. Disc cupular, obscurely 10-lobed. Ovary seated on the disc, very minute, 1-celled, contracted into a stout short style; stigma globose or obliquely oblong, much bent to one side; ovule 1, pendulous from the upper part of the cavity.

1. Pentaspadon officinalis, Holmes MSS. in Herb. Soc. Pharm. Lond. A tree 60 to 100 feet high: young branches puberulous and with prominent small brown warts. Leaves 4 to 7 in. long, the rachises puberulous or glabrescent: leaflets 7 to 9, thinly coriaceous, oblong- or elliptic-lanceolate, entire, shortly and bluntly acuminate, the base narrowed, both surfaces glabrous: the lower with tufts of short hair in some of the nerve axils, curving upwards; main nerves 6 to 9 pairs, interarching far from the margin, rather prominent on the lower surface when dry; length 1.75 to 2.75 in., breadth 8 to 1.25 in.; petiolules 15 in., those of the upper leaflets twice as long. Panicles pedunculate, as long as or exceeding the leaves, much branched towards the apex; the branchlets slender, minutely cinereous-tomentose. Flowers numerous, about 05 in. in diam., their pedicels shorter than themselves. Calyxlobes rounded. Petals obovate-round, glabrous. Drupe narrowly ellip-

tic, compressed; the pericarp fleshy, pale and covered with rusty scurf, 1-celled, 1-seeded, '65 to '8 in. long.

Perak: King's Collector, Nos. 3315, 3770, 4868, 6549, 6933: Scortechini, No. 2043; Wray, No. 4168.

This plant is known to the Malay population of Perak as the source of Minyak Plang, a dark brown viscid oil which is in great repute for the cure of certain skin diseases. An interesting note upon the plant and its oil by Mr. E. M. Holmes of the Pharmaceutical Society of London is to be found in the Journal and Transactions of that Society, Vol. LII, p. 389. The stigma in this species, prior to dissection, appears to be sub-globular with a central groove; and it is only after careful maniputation that it is seen to be bent on itself. Some specimens of this were by mistake issued from the Calcutta Herbarium under the name Microstemon officinale, Holmes.

12. RHUS, Linn.

Trees or shrubs, often with an acrid juice. Leaves alternate, simple or 1-3 foliolate or pinnate; leaflets entire or serrate. Flowers small, in terminal and axillary panicles, polygamous. Calyx small, 4-6-parted, persistent; the segments unequal or equal, imbricate. Petals 4-6, equal, spreading, imbricate. Stamens 4, 5, 6, or 10, inserted at the base of the disc, free; filaments subulate; anthers short, imperfect in the 9 flower. Ovary sessile, ovoid or globose, 1-celled: styles 3, free or curved, short or long; stigmas simple or capitate; ovule pendulous from a basal funicle. Drupe small, dry, compressed; stone coriaceous, crustaceous or bony. Seed pendulous from the funicle, testa membranous, cotyledons flattish; radicle hooked, short, superior.—Distrib: about 114 species, mostly extra-tropical in both hemispheres, a few Malayan, many from tropical Africa.

Rhus Perakensis, Scortechini MSS. A glabrous shrub climbing to the extent of 15 to 40 feet. Leaves 8 to 12 in. long, unequally punnate; leaflets in rather distant pairs, opposite, thinly coriaceous, oblong, shortly and bluntly acuminate, entire; the base slightly oblique, rounded or sub-cuneate; main nerves 16 to 20 pairs, sub-horizontal, rather prominent on the lower surface; length 2.5 to 3.5 in., breadth 1 to 1.4 in.; petiolules 1 to 1.5 in., the terminal one 3 or 4 in. Panicles axillary and terminal, longer than the leaves, pedunculate, the branches rather short, bearing the flowers on small ultimate racemes. Flowers numerous, less than 1 in. in diam., on short minutely bracteolulate pedicels. Calyx with 5 unequal oblong blunt spreading segments. Petals longer than the calyx, elliptic, blunt, pinnately nerved. Stamens 5; anthers broadly ovate, dorsifixed. Drupe compressed, obliquely reniform, orbicular, broader than long, glabrous, 2 in. across.

Perak: Scortechini, No. 1668; Wray, Nos. 2316, 3095; King's Collector, Nos. 3626, 4896, 5046, 6537, and 6807.

The nearest ally of this is probably M. succedanea, L., than which it, however, has much larger panicles and smaller more reniform drupes. It has moreover differently veined petals, and the leaflets are less narrowed to the base. It differs, however, not only from that, but from every other Indian or Malayan species in being scandent. Of the scandent habit there appears to be no doubt whatever, for the fact is noted on almost every specimen in the Calcutta Herbarium.

13. ODINA, Roxb.

Trees with few stout branches. Leaves few at the ends of the branches, alternate, unequally-pinnate, deciduous; leaflets opposite, quite Racemes simple and panicled, terminal, fascicled. Flowers small, monecious or diecious, fascicled, shortly pedicelled. Calyx 4-5lobed, persistent; lobes rounded, imbricate. Petals 4-5, imbricate. Disc annular, 4-5-lobed. MALE FLOWER Stamens 8-10, inserted within the disc. Ovary 4-5-parted. Female Flower Ovary sessile, oblong, 1-celled; styles 3-4, stout, stigmas simple or capitellate; ovule pendulous from near the top of the cell. Drupe small, compressed, oblong, sub-reniform, crowned by the distant styles; stone hard. Seed compressed; embryo curved, cotyledons flat fleshy, radicle superior. - DISTRIB. About 12 species, mostly African.

Odina Wodier, Roxb. Fl. Ind. II, 293. A small deciduous tree 20 to 40 feet high: young branches thick, puberulous at first, soon becoming glabrous. Leaves 12 to 18 in. long; leaflets 3 or 4 pairs, obliquely ovate, acuminate; the base rounded or sub-cuneate, unequal; the edges entire; length 3 to 6 in.; the petiolules 15 in. long. Male racemes compound, the female simple, puberulous. Flowers crowded in cymose fascicles on the racemes or panicles, bracts ciliate. Sepals obtuse. Petals twice as long as the sepals, oblong, spreading. Stamens in the male equalling the petals. - Drupe about '5 in. long, red. W. and A. Prodr. I, 171; Thwaites Enum. 78; Grah. Cat. Bomb. Pl. 42; Wt. Ic. t. 60; Bedd. Fl. Sylv. t. 123; Wall. Cat. 8475; Royle Ill. t. 31; Dalz. and Gibs. Bomb. Fl. 51; Brandis For. Flor. 123; Miq. Fl. Ind. Bat. Vol. I, Pt. 2, p. 622; Hook. fil. Fl. Br. Ind. II, 29; Kurz For. Flora Burm, I, 321; Engler in DC. Mon. Phan. IV, 267.

The Andaman and Nicobar Islands. Penang: (probably planted.) -DISTRIB. British India.

14. MELANOCHYLA, Hook, f.

Trees. Leaves simple, very coriaceous, exstipulate, quite entire. Punicles branched, axillary and terminal. Flowers small, unisexual. Calyx-tube persistent, slightly enlarged in fruit and adnate to the very base of the drupe, cupular or campanulate, lobes 5, erect. Petals 5, inserted on the edge of the disc; very coriaccous, persistent, erect or sub-erect, villous in front, valvate. Disc lining the calvx-tube. Stamens inserted on the edge of the disc; filaments stout, sometimes coherent at the base with the petals, villous; anthers oblong. Ovary globose, 1celled; style short, stigmas 3; ovule 1, pendulous from near the top or from the side of the cell. Drupe globose, areolate at the base by the enlarged calyx, flesh full of black varnish; stone thick, hard. Seed oblong, testa thin; cotyledons amygdaloid, radicle superior.—DISTRIB. Malayan Peninsula and Archipelago: about 12 species.

Leaves more or less hairy on the lower surface.

Leaves elliptic-oblong.

The whole of the under-surface of the leaves rusty-tomentose, panicles condensed 1. Petioles midrib and main nerves on the under surface of the leaves rusty-tomentose, panieles lax

M. densiflora.

M. tomentosa.

Leaves oblong-oblanceolate or narrowly ellipticoblong.

Lower surface of the leaves glaucescent, the midrib and main nerves with adpressed brown hairs, leaves 2.75 to 5 in. long Lower surfaces of the leaves slightly pubescent, leaves 5 to 8 in. long

M. Kunstleri. 3.

M. Maingayi.

Leaves glabrous on both surfaces.

Leaves much elongate, narrowly oblong, their bases cordate or auriculate, sessile or with very short petioles.

Drupes vertically ridged

M. auriculata. 5. M. rugosa.

. Drupes very rugose, not ridged Leaves oblong-lanceolate, oblong-elliptic or oblong-oblanceolate, with distinct slender petioles.

Inflorescence densely crowded and with large prominent bracts ... Inflorescence more or less laxly paniculate,

M. bracteata.

not bracteate. Young branches and panicles covered with

a thin felted layer of minute tomentum, flowers less than 'l in. long ...

8. M. angustifolia.

Young branches glabrous, panicles pubescent-tomentosc (not felted), flowers more than 1 in. long 9. M. nitida.

1. MELANOCHYLA DENSIFLORA, King n. sp. A tree 60 to 100 feet high: young branches stout, covered with short rusty deciduous tomentum. Leaves very coriaceous, oblong-elliptic, sometimes slightly oboyate. subacute, somewhat narrowed to the rounded slightly unequal base; upper surface glabrous, not reticulate, the midrib and nerves slightly depressed when dry; lower surface densely and minutely rusty-tomentose, the midrib very prominent as are the 20 to 25 pairs of strong subhorizontal main nerves; length 6 to 8.5 in., breadth 2.5 to 3.5 in.; petiole ·65 to 1 in., thickened and channelled near the base. Panicle terminal, condensed, shorter than the leaves, branched from the base, everywhere rusty-tomentose; branches numerous, the branchlets racemulose and bearing the flowers in ultimate sub-sessile crowded cymules. MALE FLOWERS '2 in, long, sessile; buds ovoid, gibbous near the base. Calyx fleshy, campanulate, rusty-tomentosc externally with 5 triangular sub-acute sub-erect segments. Petals 5, twice as long as the calyx-teeth, erect, thick, elliptic, obtuse, tomentose along the midrib externally, the edges glabrous, but with a tuft of coarse hairs along the lower part of the midrib. Stamens 5, shorter than the petals, anthers elliptic; filaments compressed, densely villous in front, about as long as the anthers; disc small, slightly convex, villous in the middle; ovary 0. Female flowers and drupe unknown.

Perak: King's Collector, Nos. 5615 and 5626.

A species allied to *M. tomentosa*, Hook. fil.; but at once distinguished from that by its denser panicles, larger and more numerous flowers. This is also much more hairy on the under surface of the leaves than *M. tomentosa*. Female flowers and fruit are still unknown.

2. Melanochyla tomentosa, Hook. fil. Fl. Br. Ind. II, 38. A tree: young branches rather slender, densely rufous-tomentose. Leaves coriaecous, elliptic-oblong, sometimes slightly obovate, shortly and sharply acuminate, the base rounded but slightly narrowed; upper surface quite glabrous except the pubescent base of the midrib; lower surface reticulate, glabrescent, pale when dry, the midrib and nerves more or less rufous-pubescent like the petiole: main nerves 20 to 30 pairs, spreading, prominent on the lower surface; length 6.5 to 14 in., breadth 2.75 to 4 in.; petiole: 35 in., stout, rufous-pubescent. Punicles terminal, about as long as the leaves, the main axis rufous-tomentose; the branches slender, distant, sub-erect, puberulous, spike-like, bearing the flowers in distant sub-sessile cymules. Male flowers about 1 in. in diam. Calya with 5 deep unequal ovate concave segments, puberulous externally.

Pelals 5, thick, oblong, obtuse, longer than the ealyx, pubescent outside, villous inside. Stamens nearly as long as the petals, the filaments stout. Female flower not seen. Drupe elliptic to sub-globose, ferruginous-pubescent, orange-yellow when ripe, 1 to 1.5 in. in length. Hook. fil. Ic. Plant. t. 1292, 1293; Engler in DC. Mon. Phan. IV, 470.

Malacca: Maingay, No. 1428.—Distrib. Java (fide Engler): Zollinger, No. 800.

3. MELANOCHYLA KUNSTLERI, King n. sp. A tree 80 to 100 feet high: young branches as thick as a quill, lenticellate and with deciduous sparse rusty pubescence. Leaves very coriaccous, elliptic-oblong. sometimes oblanceolate-oblong, tapering to each end, shortly acuminate: the edges with a shining cartilaginous thickening, slightly recurved when dry; upper surface glabrous, shining, not reticulate, the midrib prominent; lower surface paler, glaucescent, the midrib and 18 to 20 pairs of prominent spreading main nerves with adpressed brown hairs; length 2.75 to 5 in., breadth 1 to 1.5 in.; petiole '35 in., slightly scurfy. Panicles terminal, twice as long as the leaves, minutely rusty-tomentose, with numerous short spreading racemose branches. MALE FLOWERS 15 in, long, on pedicels shorter than themselves. Calyx coriaceous, minutely tomentose outside, cupular, deeply divided into 5 broadly-ovate acute slightly-spreading segments. Petals 5, thrice as long as the calvxsegments, narrowly elliptic, blunt, pubescent on the outer surface, densely villous on the inner surface, the margins only glabrous. Stamens 5, much shorter than the petals; the anther narrowly ovate, the filament subulate, slightly villous. Ovary 0. Female flowers and drupe unknown.

Perak: King's Collector, No. 6810.

The nearest ally of this is M. Maingayi, from which, however, this may be distinguished by the smaller leaves more shining on the upper surface, and by the adpressed brown hairs on the under surface of the midrib and nerves.

4. Melanochyla Maingayi, Hook. fil. Fl. Br. Ind. II, 39. A tree: young branches slender, scurfy-puberulous. Leaves very coriaceous, oblong-oblanceolate or narrowly elliptic-oblong, abruptly and shortly acuminate, tapering in the lower two-thirds to the short channelled petiole; upper surface glabrous, faintly reticulate, shining, the midrib very prominent; lower surface slightly pubescent; main nerves 18 to 24 pairs, spreading, prominent on the lower surface, only slightly so on the upper: length 5 to 8 in., breadth 1.75 to 2.25 in.; petiole 5 or 6 in. Panicle terminal, longer than the leaves, rusty-tomentose; the branches spreading, rather short; the ultimate branchlets cymose, about 3-flowered. Male flowers about 1 in, in diam., on short stout pedicels.

Calyx with 5 ovate acute segments; rusty-tomentose. Petals several times longer than the calyx-segments, elliptic, obtuse, externally adpressed, rusty-tomentose but with broad glabrous edges. Fenale flowers twice as large as the male; the calyx sub-urccolate; ovary globose, hairy. Drupe unknown. Engler in DC. Mon. Phan. IV, 471.

Malacca: Maingay, No. 490.

5. MELANOCHYLA AURICULATA, Hook. fil. Fl. Br. Ind. 11, 39. A tall tree; young branches very stout, glabrons. Leaves coriaceous, sessile or nearly so, oblong or oblanceolate-oblong, shortly and rather abruptly acuminate, the edges subundulate, tapering from the middle to the narrow auriculate base; both surfaces glabrous and shining, the upper drying of an olivaceous brown, very faintly reticulate, the lower livercoloured and with the reticulations more distinct; main nerves about 30 pairs, thin but distinct on both surfaces, sub-horizontal; length 12 to 18 in., breadth 3.5 to 4.75 in; petiole when present very stout, broad, less than '5 in. long, often adnate to the branch. MALE PANICLES axillary, shorter than the leaves, puberulous; the branches short, lax, cymose, 2- to 3-flowered. Flowers 3 in. long, on stout pedicels about as long as themselves. Calyx campanulate, coriaceous, minutely tomentose outside, deeply cut into 5 broadly-ovate sub-acute segments. Petals 5, longer than the calvx-segments, elliptic, obtuse, externally adpressed-pubescent, but with the edges glabrous, internally minutely pubescent and with a large villous tuft in the lower half. Stamens 5, shorter than the petals, with small anthers and pubescent filaments. Female flowers not seen. Drupe oblong, obtuse or depressed-globose, rusty-tomentose, when ripe 1.25 to 1.5 in. long, vertically ribbed, stone very thick. Engler in DC. Mon. Phan. IV, 470.

Malacca: Maingay, No. 491; Derry, No. 1189. Singapore: Ridley, Nos. 3588, 3975.

6. Melanochyla rugosa, King n. sp. A large tree: young branches as thick as a goose-quill, tawny-pubescent with long pale flexuose hairs intermixed. Leaves coriaceous, narrowly oblong, sometimes almost oblanceolate, shortly and sharply caudate-acuminate, tapering very gradually to the cordate sub-auriculate base: upper surface smooth, shining, and quite glabrous; the lower dull, pale, and distinctly reticulate, glabrous except a few scattered stiff hairs near the base of the stout grooved midrib; main nerves 25 to 30 pairs, spreading, curving upwards and interarching at the apices; length 7 to 15 in., breadth 1.6 to 3.25 in.; petiole 35 to 5 in., very stout, dilated, pubescent like the young branches. Male panicles not seen. Female panicles terminal, about half as long as the leaves, stout, rusty-pubescent, with a few distant short branches. Female Flowers 3 in. in diam.

depressed-hemispherie, sessile. Calyx coriaceous, tomentose outside. divided into 5 orbicular-ovate acuminate concave conniving segments. Petals 5, not much exceeding the ealyx, coriaccous, broadly triangular, minutely pubescent, with a small villous patch at the base in front. Stamens rudimentary. Ovary broadly conical, rusty-tomentose; the style terminal, glabrescent, shorter than the ovary; stigma capitate, 3lobed. Drupe globular-ovoid, very rugulose, rufous-tomentose, '75 to 1 in, long and '65 to '9 in, in diam, (probably not quite mature).

Perak, at Tapu: Wray, No. 1301.

A species with leaves somewhat like those of M. quriculata, but smaller: collected only once.

7. Melanochyla bracteata, King n. sp. A tree 50 to 80 feet high: young branches slender, glabrous, with pale lenticellate bark. Leaces coriaceous, narrowly oblong-lanceolate, tapering to each end, the apex caudate-acuminate, the base narrowly cuneate; both surfaces glabrous: the upper shining; the lower dull, paler than the upper, glaucescent; main nerves 10 to 12 pairs, slender, faint, curving upwards: length 4 to 6 in., breadth 1 to 1.6 in.; petiole .5 to .75 in., thickened in the lower half. Male flowers '25 in, long, crowded in small sub-sessile cymules on axillary or terminal rusty-pubescent congested racemes or few-branched panieles as long as or longer than the leaves; bracts at the bases both of the cymules and of the individual flowers, ovate, acuminate, concave, rusty-pubescent like the calyx and petals, and as large as the flowers. Calyx campanulate, with 5 ovate acute segments. Petals 5, longer than the segments of the calyx, lanceolate, acuminate, with a dense villous tuft on the lower half of the anterior surface Stamens 5, shorter. than the petals; the anthers linear, glabrous, the filaments thick, compressed and densely villous from base to apex. Disc lining the inflated tube of the ealyx, ovary none. Female flowers not seen. Drupe ovoid or ovoid-globular, minutely tomentose, about '75 in in length, the pericarp with a thick black juice.

Perak: King's Collector, Nos. 5549 and 7303.

A very distinct species distinguished by the small size of its leaves and by its congested bracteate inflorescence.

8. MELANOCHYLA ANGUSTIFOLIA, Hook. fil. Fl. Br. Ind. II, 39. A trec: young branches slender, covered with a thin close layer of very minute tomentum. Leaves coriaceous, oblong or oblanceolate-oblong, shortly acuminate, the edges slightly undulate, the base cuneate, sometimes unequal, both surfaces glabrous, the lower reticulate: main nerves 12 to 16 pairs, spreading, prominent like the midrib on the lower surface, less so on the upper, length 4.5 to 10 in., breadth 1.5 to 4 in.; petiole '75 to 1'5 in., dilated and channelled near the base.

Panicles of Male Flowers axillary or terminal, as long as or much longer than the leaves, very sleuder, with many spreading branches, everywhere minutely tomentose like the young branches. Male Flowers in lateral cymules from the branchlets, sub-sessile, less than 'l in. long; calyx tubular-campanulate, the lobes ereet, oblong-triangular, sub-acute, rusty-tomentose externally; petals oblong, sub-acute, much longer than the calyx, adpressed-pubescent outside, villous in the lower half inside; stamens shorter than the petals, the anthers small, elliptic; the filaments subulate, villous, ovary none. Panicles of Female Flowers shorter than the males: female flowers not seen. Drupe globose, apiculate, minutely tomentose like the paniele, '5 to '75 in. in diam. Engler in DC. Mon. Phan. IV, 469.

Malacca: Maingay, No. 492. Perak: King's Collector, No. 3359.

9. Melanochyla nitida, King n. sp. A tree; young branches rather slender, angled and dark-coloured when dry. Leaves very coriaeeous, oblong-elliptie or oblanceolate-oblong, shortly bluntly and rather abruptly acuminate, narrowed from the middle or below it to the long plano-convex stout petiole; both surfaces quite glabrous; the upper shining and not reticulate; the lower paler, dull, with the wide reticulations slightly prominent; main nerves 12 to 16 pairs, slightly prominent on both surfaces when dry, spreading and curving upwards: length 4 to 11 in., breadth 2.25 to 3.25 in.; petiole 1 to 2 in., thickened in the lower half or third. Panicles terminal, minutely tomentose, but not felted, slightly longer than the leaves; the branches few, scattered, ascending, having few spicate short branchlets bearing the flowers in ultimate sessile cymules. MALE FLOWERS more than 'l in. long, sessile, erowded; calyx eoriaceous, campanulate, deeply eut into 5 broadly-triangular acute sub-erect concave segments, tomentose outside: petals 5, triangular-oblong, thick, longer than the ealyx-teeth, adpressed-pubescent externally but with broad glabrous edges; internally glabrous but with a large tuft of eoarse hair on the middle of the lower half: stamens 5, shorter than the petals, the filaments densely villous; disc small, villous in the middle; ovary none. Female flowers '2 in. long, on short pedicels; stamens present but apparently without pollen; ovary filling the whole fundus of the flower, hemispherie, densely rusty-tomentose, tapering into a short stout conical hairy style; stigma sub-capitate. Drupe unknown.

Perak: Scorteehini, No. 2037; Wray. Penang: Curtis, No. 1496. Perak: King's Collectors, No. 6722.

The nearest ally of this is *M. angustifolia* which has, however, its young branches and panicles covered with a thin felted layer of minute tomentum; whereas, in this plant, the young branches are glabrons

and the panicle is pubescent-tomentose not felted. The flowers of this moreover are larger than those of *M. angustifolia*, the main nerves are more oblique, and the reticulations wider and less distinct.

15. SEMECARPUS, Linn. f.

Trees. Leaves alternate, simple, quite entire, coriaceous. Flowers small, polygamous or diocious, in terminal or axillary panieles. Calyx 5-6-fid, segments deciduous. Petals 5-6, imbricate. Disc broad, annular. Stamens 5-6, inserted at the base of the disc, imperfect in the 9 flowers. Ovary 1-celled; styles 3; ovule pendulous from a basal funicle. Drupe fleshy, oblong or sub-globose, oblique, scated on a fleshy receptacle formed of the thickened disc and calyx base; pericarp loaded with aerid resin. Seed pendulous, testa coriaccous, inner coat somewhat fleshy; embryo thick, cotyledons plano-convex, radicle superior.—Distrib. About 40 species, tropical Asiatic and Anstralian.

Leaves densely rusty-pubescent on the lower surface 1. S. velutina.

Leaves with the lower surface densely clothed with pale very minute scales 2. S. Curtisii.

Leaves at first puberulous on the lower surface but ultimately glabrous.

Panicles tomentose; flowers glabrous, sessile; leaves oblanceolate-oblong, with 20 to 26 pairs of nerves Panicles puberulous, flowers pedicelled; leaves broadly elliptic, with 10 to 15 pairs of nerves ... Leaves quite glabrous; panicles glabrous in the lower part, pubescent towards the extremities; flowers subsessile, the calyx puberulous: leaves

oblanceolate-oblong, with 18 to 24 pairs of main

4. S. lucens.

S. Kurzii.

3.

nerves 5. S. Prainii.

1. Semecarpus velutina, King n. sp. A director tree 50 to 60 feet high: young branches softly rufons-pubescent, the bark pale. Leaves thickly coriaceous, obovate-elliptic or oblanceolate, rarely elliptic, shortly and abruptly acuminate, the edges sub-undulate, narrowed from the middle or above it to the stout petiole; upper surface glabrous except the slightly-pubescent depressed midib, shining and minutely reticulate; the lower surface densely and softly pubescent, the transverse veins and the reticulations distinct; main nerves 20 to 24 pairs, slightly depressed on the upper surface, very prominent on the lower, spreading and interarching near the edge; length 6 to 13 in., breadth 2.5 to 5 in.; petiole '5 to 1.25 in. Panicles of flowers of both sexes

terminal, stontly pedunculate, rusty-tomentose, those with female flowers longer than the leaves, those with males shorter; the branches of both short, ascending, those of the male more numerous. MALE FLOWERS 1 in. in diam., much crowded in short sub-globular sessile cymose fascicles; calyx cupular, flat, with 5 spreading broad triangular acute teeth, pubescent outside; petals 5, longer than the sepals, broadly elliptic, acute, glabrescent. Stamens 5, the filaments longer than the petals; disc broad, convex, fleshy, hairy in the middle; ovary none. FEMALE FLOWERS less numerous than the males and twice as large: calyx rusty-tomentose and petals pubescent outside; petals acute. Stamens with very small anthers. Ovary obliquely hemispherical, slightly compressed, densely rusty-tomentose: styles 3, short, horizontally radiating, pubescent; stigmas truncate. Drupe transversely oblong, ·35 in. from base to apex and ·6 in. from side to side, compressed, sparsely tomentose, the enlarged peduncle about one-third of its length, thin, cup-shaped, sparsely pubescent.

Perak: King's Collector, Nos. 7439, 7622 and 7655.

Allied to S. Anacardium, Linn. fil., but well distinct from that and from any other hitherto described species.

2. Semecarpus Curtisii, King n. sp. A small tree: young branches stout, their bark pale. Leaves coriaceous, oblanceolate-oblong, shortly and bluntly acuminate, the edges slightly undulate, gradually narrowed from the upper third to the stout petiole, upper surface shining, greenish when dry, reticulate; the lower dull, pale from very minute scales; main nerves 18 to 20 in., spreading and interarching within the pale cartilaginous edge, very prominent and pale on the lower surface, faint on the upper; length 13 to 16 in., breadth 4 to 5 in.; petiole 1.5 to 2 in., very stout. Panicles much shorter than the leaves, branching from near the base; the branches ascending, angled, tawny-puberulous, the ultimate branchlets cymose. Flowers unisexual and the sexes on different panicles, shortly pedicelled. MALE FLOWERS 15 in. in diam.; calyx cupular, with 5 ovate sub-acute spreading segments, minutely tomentose externally: petals 5, spreading, much longer than the calyx, elliptic, obtuse, minutely tomentose on the outer, glabrescent on the inner surface; stamens 5, longer than the petals, the anthers small, the filaments narrow, compressed; disc subconvex, pubescent; ovary 0. FEMALE FLOWERS larger than the male; stamens rudimentary; ovary obliquely globose-ovoid, compressed, densely tomentose; styles 3, radiating, horizontal or depressed, glabrous, bifid at the apex. Drupe unknown.

Tongka: Curtis, No. 2930.

A very distinct and handsome species; readily recognised amongst
J. 11, 65

the Malayan species by its large leaves which are very pale glaucescent beneath: collected hitherto only by Mr. C. Curtis, of the Forest Department, Penang.

3. Semecarpus Kurzh, Engl. in DC. Mon. Phan. IV, 489. A small tree: young branches stout, rough and lenticellate, covered with deciduous dense minute rusty tomentum. Leaves corraceous, oblanceolate-oblong, suddenly and very shortly acuminate, gradually narrowed in the lower three-fourths to the short stout dilated petiole, the edges subundulate: both surfaces minutely reticulate; the upper glabrous, shining, olivaceous when dry; the lower pale brown when dry and not shining, glaucescent, sparsely covered with short stiff decidnous hairs; main nerves 20 to 26 pairs, spreading, slightly ascending, interarching near the edge, prominent on the lower surface rather faint on the upper; length 12 to 24 in., breadth 3 to 4.25 in.; petiole stout, dilated, channelled, '6 to 1 in. long. Panicle terminal, longer than the leaves, the main rachis stout; the branches slender, ascending, lax, the ultimate branchlets spicate, everywhere tomentose, Flowers sessile, 'l in. in diam. Calyx cupular, thick, with 5 shallow spreading orbicular teeth, sub-ciliate at the edges, otherwise glabrous. Petals 5, much longer than the calyx, broadly elliptic, sub-acute, glabrous externally, puberulous internally. Stamens 5, shorter than the petals; the filaments flattened, puberulous. Disc convex, glabrous; rudimentary ovary pilose. Drupe obliquely ovoid, sub-compressed, keeled, glabrous, 1 in. long, and about as much across the swollen peduncle, deciduously pubescent, obconic, about 5 in. long. S. heterophyllus, Kurz (not of Blume) in Journ. As. Soc. Beng. Vol. XLV, Pt 2, (1876) p. 126; For. Flora Burma, I, 312.

Nicobar Islands: Jelinek, No. 210; Kurz; King's Collector. Bati Malv, Dr. Prain.

Distinguished by its long lax tomentose panicle and glabrous sessile flowers. Dr. Prain's specimens from the little-known island of Bati Maly are in ripe fruit and have no flowers, but I have no hesitation in referring them to this species.

4. Semecarpus lucens, King n. sp. A tree 40 to 70 feet high; young branches rather slender, with pale glabrous bark. coriaceous, broadly elliptic, rarely sub-ovate-elliptic, the apex obtuse and rounded or very shortly and abruptly acuminate; the edges with a shining pale margin, sub-undulate, the base cuneate and slightly oblique; upper surface glabrous and shining, greenish when dry, reticulate; lower surface pale brown when dry, not shining, conspicuously reticulate, the nerves and reticulations broad and shining, sparsely shortly and deciduously puberulous; main nerves 10 to 15 pairs, stout, shining, broad and conspicuous on the lower surface, thin and only slightly prominent on the upper, spreading, interarching near the edge: length 4 to 7.5 in., breadth 2 to 3.25 in.; petiole .75 to 1.5 or even 2 in., thickened near the base. Panicles usually terminal, pedunculate, longer than the leaves, puberulous; the branches slender, long, lax, sub-erect; the branchlets short and bearing the flowers in rather crowded ultimate fascicles. Flowers 15 in. in diam., on pedicels shorter than themselves. MALE FLOWERS; calyx cupular, flat, with 5 ovate acute spreading teeth, glabrous; petals 5, ovate-lanceolate, acute, several times longer than the calyx, glabrous: stumens 5, shorter than the petals; the cells of the anthers divergent, the filaments flattened; disc fleshy, flat, with a small concave pit, puberulous. Female flowers on smaller fewer-flowered panicles; the flowers themselves larger than the males; calyx as in the male; petals broader and more fleshy. Stamens 5, short and rudimentary, each rising from one of the angles of the cupular fleshy 5 angled glabrous disc. Ovary tomentose, conical, slightly oblique, its base surrounded by the disc. Styles 3, horizontal or depressed, radiating. Drupe (young) obliquely ovoid, compressed, the enlarged peduncle about a third of its length, rusty-puberulous.

Perak: King's Collector, Nos. 5256, 5377, 5414, 5470, 6895.

5. Semecarpus Prainii, King n. sp. A tree 40 to 50 feet high; young branches rather stout, deciduously puberulous. Leaves oblongoblanceolate to obovate-oblong, shortly and abruptly acuminate, the edges slightly undulate, gradually narrowed from the upper third to the rather short petiole; both surfaces glabrous and minutely though distinctly reticulate, the upper pale-greenish when dry, the lower pale brown; main nerves 18 to 24 pairs, prominent on the lower surface, slightly so on the upper, the lower pairs sub-horizontal, the upper spreading and curving upwards; length 5 to 10 in., breadth 1.5 to 3.25 in.; petiole 5 to 8 in. Panicle terminal, pedunculate, glabrous below, pubescent towards the extremities, longer than the leaves; the branches numerous, slender, with many branchlets, the ultimate branchlets cymulose. Flowers rather crowded, almost sessile, globular in bud, about 'l in. in diam. when expanded. Calyx cupular, puberulous, rather coriaceous, with 5 broadly-ovate obtuse ciliate spreading segments. Petals 5, imbricate, longer than the calyx, glabrous, broadly ovate, acute. Stamens 5, shorter than the petals. Disc fleshy, convex, dark-coloured, with a tuft of hairs in the middle; ovary in the male flower absent. Drupe obliquely obovoid, compressed, glabrous, about 5 in. long and 65 in. broad; the enlarged peduncle obconic, 35 in. long, glabrous. S. heterophyllus, Hook. fil. (not of Blume) Hook. fil. Fl. Br. Ind. II, 35.

Barren and Little Cocos Islands; Prain. Andamans: Prain, King's Collectors. Perak: King's Collector, No. 7442 Andamans: Helfer, No. 1131.

There is a large suite of specimens of this species in the Calcutta Herbarium (twelve gatherings from the Andamans alone). I have dissected flowers of every one of these which is in flower, and I find that they all agree perfectly with each other. They also agree absolutely with Helfer's specimen, No. 1131. With the plant collected in Perak by the Bot. Garden Collector (No. 7442) they also as to flowers and leaves (fruit is absent) agree, except that the Perak plant has slightly larger flowers and that the calyx-lobes are longer and more acute. Helfer's specimen above quoted has, however, been referred by Dr. Engler, in his excellent monograph of the family of Anacardiaceae, to Semecarpus albescens, Kurz. To that identification I must, with all respect, demur. Moreover an examination of the large suite of specimens of S. albescens in the Calcutta Herbarium proves that that plant is not a Semecarpus, but a Holigarna; for it has quite the fruits and spurred petioles of the latter genus. Its name ought therefore to be changed to Holigarna Kurzii; the specific name albescens being too like albicans which has already been applied to another species. Kurz was rather unfortunate in his treatment of this family. His Holigarna Grahami was not, as he supposed, the Semecarpus Grahami of W. and A., which is a plant confined to the West of British India and which does not extend to Burma. For the Burmese specimens included by Kurz under H. Grahami, Sir Joseph Hooker has substituted the name H. albicans, (Fl. Br. Ind. II, 38.) My own opinion, however, is that these Burmese plants are nothing more or less than H. longifolia of Roxburgh, of which species that author has left an admirable coloured figure in the Calcutta Herbarium.

Besides the foregoing there are, in the Calcutta Herbarium, specimens from Perak (King's Collector, No. 6623) of a species of *Seme-carpus* which, except in the finer reticulation of the leaves, agree excellently with Beccari's Bornean specimens, No. 2875, and 3318, which have been named *S. glauca* by Dr. Engler. (DC, Mon. Phan. IV, 478).

16. Drimycarpus, Hook. f.

Trees. Leaves alternate, petioled, simple, quite entire. Racemes or panicles axillary. Flowers small, subglobose, polygamous. Calyx superior; lobes 5, rounded, imbricate. Petals 5, erect, sub-orbicular, imbricate. Disc broad, annular. Stamens 5, inserted at the base of the disc. Ovary in the male flowers 0, in the female inferior, I-celled; style 1, very short; stigma capitate; ovule attached to the wall of the cell. Drupe transversely obliquely ovoid, fibrous, flesh resinous; stone coriaceous. Seed attached to the wall of the cell, testa membranous; embryo thick, cotyledons plano-convex; radicle minute, opposite the hilum; plumule hairy. A single species.

DRIMYCARPUS RACEMOSUS, Hook, fil. in Benth, and Hook, fil. Gen. Plantar, I, 424. A large tree: young branches rather slender, somewhat glaucous, the bark afterwards pale and striate. Leaves coriaceous, oblanceolate or oblong-lanceolate, shortly acuminate, the edges conspicuously undulate, the base cuneate; upper surface glabrous, shining, the lower dull often glaucous or glaucescent, the reticulations distinct in both; main nerves 14 to 18 pairs, spreading, often irregular, prominent beneath: length 4 to 6 in., breadth 1.2 to 2.25 in.; petiole ·35 to ·5 in., channelled. Flowers in racemes or panicles, terminal or in the uppermost axils, shorter than the leaves, puberulous, slender, the panicles branched from the base; male flowers sessile, fasciculate, the females shortly pedicelled, both about 'l in. in diam. Anthers shortly ovate, filaments thick. Disc crenate, fleshy. Drupe broader than long, red when ripe, 1 in. or more broad, and about '75 in. long. Hook. fil. Fl. Br. Ind. I, 36; Kurz For. Flora Burma I, 314; Engler in DC. Mon. Phan. IV, 472. Holigarna racemosa, Roxb. Fl. Ind. II, 82; Wall, Cat. 1006.

The Andaman Islands.—DISTRIB. Burma, the Assam Range, and the lower slopes of the Eastern Himalaya.

17. Dracontomelum, Blume.

Trees. Leaves alternate, unequally-pinnate; leaflets opposite or alternate, quite entire. Panicles axillary and sub-terminal. Flowers hermaphrodite. Sepals 5, imbricate. Petals 5, sub-erect, sub-valvate. Disc large, cup-shaped, crenulate. Stamens 10, inserted at the base of the disc. Ovary sessile, 5-celled; styles 5, thick, erect, connate by their obtuse stigmatiferous tips; ovules solitary and pendulous in the cells. Drupe globose, fleshy, tubercled above the middle by the style-bases; stone hard, depressed, 2-5-celled; cells diverging, opening by canals through the top of the stone. Seeds compressed, pendulous, testa membranous; cotyledons plano-convex; radicle short, superior, centrifugal.—DISTRIE. 5 species natives of tropical Asia and the Pacific.

Dracontomerum mangiferum, Blume Mus. Bot. Lugd. Bat. I, 231, fig. 42. A tree 80 to 100 feet high; young branches stout, densely covered with minute deciduous tawny-tomentum. Leaves 12 to 20 in. long, their rachises minutely puberulous or glabrous, the petiole slender and but little thickened at the base; leaflets 5 to 8 pairs, alternate, rarely sub-opposite, thinly coriaceous, the upper ones elliptic-oblong, the lower ovate-oblong and shorter, all shortly and abruptly acuminate, unequal-sided with rounded oblique bases: both surfaces minutely reticulate when dry, the upper quite glabrous, the lower also glabrous but the midrib often puberulous and with small tufts of hair in the nerve

axils: main nerves 9 to 12 pairs, spreading, carving, rather prominent beneath; length 4 to 9 in., breadth 1.75 to 2.75 in.; petiolules 15 to 2 in. Panicles nearly as long as the leaves, from above the axils of the upper leaves or sub-terminal; the branches minutely tawny-pubescent, spreading, only about 4 to 15 in. long, the ultimate branchlets few-flowered, minutely bracteolate. Flowers 3 in. long. Sepals united at the very base, a little shorter than the petals, elliptic, obtuse, minutely pubescent outside, pale. Petals oblong-lanceolate or spathulate, their apices recurved or linear, narrower than the sepals, inserted on the edge of the disc. Stamens about as long as the petals; the anthers narrowly oblong, cordate at the base, the filaments subulate. Disc broad, obsoletely crenulate. Ovary oblong-ovoid, deeply divided vertically into five 1-celled 1-ovuled lobes: styles long, slender, connate by their apices, stigma 5-lobed. Drupe depressed-globose, an inch or more in diam., mesocarp copious; the stone much depressed, very rugulose, crustaceous and with marginal pores. Hook. fil. Fl. Br. Ind. II, 43; Kurz For. Flora Burma, I, 322; Eugler in DC. Mon. Phan. IV, 252.

In all the Provinces: a common tree.

ADDITION TO CHAILLETIACEE.

Since writing out this Natural Order for the last number of these papers, I have received two new species of the genus Chailletia of which I now give descriptions. And, in order to fit these into the key to the species given at p. 91 of the last volume of this Journal, I here reproduce that key, with these two new species introduced into their proper places and indicated by the letter a following the number of each.

Leaves oblong or elliptic-lanceolate.

Leaves very thin, quite glabrous; cymes globular, 25 to 4 in. in diam. ... 1. C. tenuifolia. Leaves coriaceous, glabrous except the midrib, strigose at the base; cymes 1 to 2 in. in diam.... 2. C. Hookeri. Leaves membranous, with many fulvous bristles on the edges midribs and nerves ... C. Griffithii. 3. Leaves-elliptic or oblong-elliptic. Leaves coriaceous, upper surface with scattered bristles with bulbous bases, lower surface hispid especially on the midrib and 3a. C. setosa. Midribs of leaves strigose beneath; cymes

·5 in. in diam. : ripe drupes ·65 in. broad

Midribs of leaves quite glabrous, cymes '3 in. in diam.; ripe drupes 1.25 in. in diam.

C. Helferiana.

C. Laurocerasus.

5.

Leaves everywhere quite glabrous, their under surfaces tesselate-areolar ... 5a. C. tesselata.

Leaves elliptic but more or less oblanceolate or obovate, glabrous 6. C. andamanica.

Leaves elliptic-obovate, retuse, minutely tomentose on the lower surface ... 7. C. deflexifolia var. tomentosa.

3a. CHAILLETIA SETOSA, King, n. sp. A slender creeper; young branches and under surfaces of leaves with long yellow bristly hairs. Leaves coriaceous, elliptic-oblong, acuminate, the base narrowed to the very short petiole; upper surface shining, with scattered bulbous-based bristles most numerous on the midrib near its base; lower surface of a yellowish-olivaceous colour, much reticulate; main nerves 9 or 10 pairs, curving upwards, very prominent and bristly on the lower surface, less so on the upper; length 6 to 8.5 in., breadth 2 to 3.25 in.; petiole 15 in. long, densely hispid. Cymes axillary, very short, often in pairs, 4-to 6-flowered, almost sessile. Flowers 2 in. long. Sepals oblong, blunt, very concave, much imbricate, densely pale-tomentose outside, glabrescent inside. Petals shorter than sepals, oblong-obovate, the apex with 2 rounded concave lobes, quite glabrous. Stamens as long as the petals, glabrous; the anthers adnate; the connective broad and bearing the narrow cells on its margin. Ovary densely lanate. Fruit unknown.

Perak: King's Collector, No. 10429.

A species closely allied to C. Griffithii, Hook. fil.; but with larger leaves of thicker texture and very much more hispid.

5a. CHAILLETIA TESSELATA, King, n. sp. A slender woody climber, 10 to 15 feet long: young branches glabrous, shining, the bark black when dry. Leaves coriaceous, more or less broadly elliptic or ellipticoblong with a short sub-acute often abrupt apical point; narrowed in the lower fourth to the petiole, the edge slightly recurved: both surfaces quite glabrous, the upper shining with numerous very minute black dots, the lower tesselate-reticulate: main nerves 6 or 7 pairs, spreading, much curved upwards and forming wide arches far from the edge, prominent on the lower surface; length 4.5 to 5 in., breadth 2.5 to 3 in.; petiole '4 in. long, rough when dry and with transverse ridges, puberulous. Cymes axillary, in pairs, shortly pedunculate, muchbranched, many-flowered, minutely yellowish-tomentose, from 5 to 1 in. in diam. Sepals oblong, obtuse, tomentose on the outer surface, glabrous on the inner. Petals glabrous, obovate, sub-acute, deeply bifid at the apex, the lobes oblanceolate. Stamens longer than the petals, exserted, glabrous, the broad orbicular connective bearing the narrow anther cell on its edge; the filaments thick. Ovary ovoid, covered with white wool. Style longer than the ovary, stigma bifid. Fruit unknown.

Trang: Wray, No. 3185. Perak: King's Collector, No. 6726.

A species of which the nearest ally is C. Hookeri, King, which has however much narrower leaves not tesselate on the lower surface. This is also allied to the Bornean species C. Beccariana, Stapf, which has however much smaller leaves, not tesselate beneath.

Natural History Notes from H. M. Indian Marine Survey Steamer 'Investigator,' Commander C. F. Oldham, R. N., commanding.—
Series II., No. 24. Report on the Paguridæ collected during the season 1893-94.—By J. R. Henderson, M.B., F.L.S., Fellow of the University of Madras, Professor of Biology in the Madras Christian College.*

[Recd. 23rd June—Read 1st July.]

The Paguridæ collected by the "Investigator" during the season 1893-94, form a small but interesting collection of seventeen species. for the opportunity of examining which I am indebted to my friend Surgeon-Captain A. R. Anderson, I. M. S., the Surgeou-Naturalist of the "Investigator." The small number of species is doubtless to be explained by the fact that no special attention could be paid to shallowwater forms; had time and opportunity permitted, the number of these might have been very largely increased. Of the seventeen species taken, two have been left unnamed, as the specimens by which they are represented are either very young or are in an imperfect state of preservation. The collection also contains an undescribed Glaucothoë which appears to be a larval form, and I have therefore not given it a specific name. Of the fourteen named species no less than seven are described as new, and the remaining seven-six of which are from shallow water -- belong to previously known species. The large proportion of new species is not remarkable when the deep-water habitat of the majority is taken into consideration. The fourteen species are included in no fewer than ten genera.

The specimens were taken at six dredging stations, at five of which the depth exceeded 100 fathoms, so that the collection may fairly be described as a deep-water one. The greatest depth at which Pagurids were taken during the trip was 719 fathoms, off the North Maldive Atoll, where two new species of the characteristic deep-water genus Parapagurus were obtained. The last dredging station on the list is a shallow-water one off the east coast of Ceylon, where from 28 fathoms six species were obtained, three of which are new. There are

^{*} Communicated by the Natural History Secretary.